to hint, may it be to the advantage of the public.

Subject to the above reserve, we find that the total sum expended since 1852, by the Science and Art Department, on buildings, is set down at 208,601*l.*, a figure attained by the close of the year 1869–1870. From this time to 1874–1875, the sums voted for the same buildings have been, for South Kensington new buildings, 149,145*l.*, and Bethnal-green Museum new buildings, 10,122*l.*, making a total of 357,868*l.*, which we conclude must approximately represent the cost of the blocks of buildings at South Kensington, and of the succursal establishment at Bethnal-green.

This, it will be seen, is a large sum. It is one of which it is very desirable that we should have a clear, definite, and exact statement, accompanied by such a plan and description of the buildings erected as will enable the architect to arrive at the cost per square yard of area and per cubic foot of structure. This information is the more desirable from the fact that the buildings in question have been, for the most part, built under the direction of men who, though of undoubted eminence in their own profession, were not regularly educated civil architects. Beyond this, in the buildings in this vicinity, including those which may be taken to form a part of the general system, although the cost of the erection was not defrayed by Parliamentary grants, much reliance was placed on the use of models, instead of regular drawings, for the guidance of the detailed execution of novel designs. For two reasons, therefore, it is important to have definite information as to this large group of buildings. It is becoming, as we shall presently see, each year more important for us to have a thorough practical knowledge of the laws that regulate combined buildings, especially with reference to their cost; and it is further desirable to see whether any gain or any loss, in an economical sense, is obtained by the employment of military in lieu of civil architects. It is hard to say whether these questions are of most importance to the architectural profession or to the tax-paying and house-requiring community.

Besides this sum of nearly 360,000*l.*, 36,735*l.* have been voted since 1870, for the works and buildings of the British Museum; 47,000*l.* for those of the Edinburgh Industrial Museum; and 246,000*l.* for the Natural History Museum. With regard to this last building, the information is particularly vague. The total votes, for five years, amount, as above stated, to 246,000*l.* There is the note to which we also referred as to only 66,286*l.*, having been expended, out of 166,000*l.* voted in four years. The difference of 80,000*l.* is the vote for the current year, out of which we have no means of knowing how much will be expended, and how much will be "lost," not to the nation, but to the apparent credit of the building. As Parliament has already voted 140 per cent. more than the directors of the work have managed to expend, to the close of the last financial year, we are unable to form any estimate how far the 80,000*l.* which is set down to their credit for the current year will be expended, or how far the vote may lapse.

While on this part of the subject, it may be as well to add that the expenditure on all grounds, with the exception of buildings by the Science and Art Department, since 1852, has amounted to 2,736,511*l.*, being at the average rate of 124,366*l.* per annum. For the last five years the ordinary maintenance of the South Kensington, Bethnal-green, and Jermyn-street Museums has cost 40,077*l.* per annum, and 16,970*l.* per annum have been laid out on specimens and books. In the Abstract of Expenditure for the three years ending 1873, 1874, however, only the sum of 40,333*l.* is set down to South Kensington Museum. It may be due to our imperfect acquaintance with the mysteries of return-making that there seems to be here some discrepancy, especially as the charge for 1872–3 is only 34,967*l.*, and that for 1872 is 34,222*l.* But the figures as they stand will not be more intelligible to nine hundred and ninety-nine out of every thousand of our readers than they are to ourselves. They illustrate, at all events, the difference between a reply that may be satisfactory to the various members who move for returns, and that which is of value to architects who are seeking figures for their own guidance, and public writers, who are devoting time and labour to assist them in so doing.

The heads of service under which the expenditure of the Science and Art Department are divided are seventeen. Of these the Science and Art Schools alone cost 104,186*l.* in the year 1873, 1874. South Kensington is the item next in importance. Then comes the line which, no doubt, includes the materials for explaining many apparent discrepancies between the several returns. Services common to the several divisions, 26,505*l.* This is exclusive of the cost of administration of the department, 4,483*l.*, and of "expenses of purchases, circulation," &c., 23,113*l.* The geological survey of the United Kingdom cost 21,010*l.* in the year under review, the total outlay in which, for the department, was 257,788*l.* The sums of 51,815*l.* for salaries, and 51,640*l.* for specimens and books, for the British Museum, are not included in this return. As a strictly educational grant, they raise the total under the two heads united to 361,243*l.* for the year. Here, again, we observe that the Edinburgh Museum for Science and Art is debited with a total charge of 7,510*l.* for maintenance, salaries, and purchases, during the years 1873-74, in Mr. M'Laren's return, and for a total of 9,064*l.*, exclusive of any share in the "services common to the several divisions," in Mr. Sullivan's return. We confess to more difficulty in understanding this difference than we found in the former instances. One thing, however, is tolerably clear,—we are without any plain, full, exhaustive return of the national expenditure for museums, schools, and similar art and educational purposes, as it is commonly incurred under the sanction of Parliamentary votes. It would be a public service if any independent member would move for such a return.

We now come to the definite practical aim with which we first undertook the examination of returns that are not, perhaps, all that could be wished. It is with reference to the relative cost of accommodation in large and small buildings. This is a matter of extreme importance. The provision of dwellings for the artisans, and for the poor, is one of the most perplexed questions that awaits the practical decision of the builder. Every one admits that we must turn over a new leaf in this respect. At the present moment the dwellings of the poorer classes may be grouped in two main divisions, of course with certain noble exceptions. Where the growth of a city has been, not only rapid and continuous, but general, we frequently find that large houses, built probably for opulent traders, and important city magnates, gradually being hemmed in by the growing mass of building, have first suffered in fashion; then fallen into disrepair; and finally, divided into small sub-tenements, or single rooms, have come to resemble a hive of unhealthy inhabitants, rather than a well-designed and well-constructed building. On the other hand, where the growth of population has arisen from the development of some special industry, as in Birmingham and many other manufacturing towns, the rapid demand has called into existence a web of small houses, built with a view of holding a single family each; but built always on the very cheapest plan, often of the least durable materials and workmanship; and possessing, in all cases, the very great disadvantage of covering an acreage altogether disproportionate to the amount of cubic accommodation which that area ought properly to afford.

It may be urged by the orthodox disciples of the *far-niente* school, that the laws of political economy prohibit any meddling with matters of this sort. They should be left to settle themselves. Supply and demand are correlative terms. If good homes are required by the poor, they will be forthcoming. If they are not required, it would be contrary to the principles of political economy to supply them. Rent must be paid in proportion to accommodation, and where rent is not forthcoming, or is inadequate, accommodation must follow the same rule.

It is very imposing to hear doctrines of this clear and peremptory nature laid down by men who give us the idea of being excellent judges of all that most conduces to creature comforts, and of making a practice of availing themselves of the full advantage of that superiority of their judgment. But we confess to being somewhat heretical in the matter. We are not so comfortably convinced as might be desired that it is nothing to us whether our nearest neighbours are well housed, ill housed, or not housed at all. There are a good many,—we hope an increasing number,—of persons who share our own want of true politico-economic education to this extent. Add to these a large number who are under the influence of fright. One man looks at the returns of epidemic diseases, and of increasing death-rate. He thinks it likely to infect his establishment; Lazarus *will* sit on the flags before his door; and if Lazarus points out that he should be happy to go to some spot of his own, so that one is provided for him, and to leave the flags free for the rush of the healthy breeze, Dives,—albeit, with a grumble, not to say a curse,—will put his hand in his pocket to provide the needed refuge. Thus one from a good motive, another from a purely selfish one, very many from mingled motives of undefined human sympathies, make up so numerous a body that we think it is pretty clear that, in spite of the eternal co-relation of demand and supply, Englishmen in the mass will come to the conclusion that the problem of providing decent and reasonable dwellings for the poor shall be looked in the face and practically solved. We need hardly add that the great clearances caused by metropolitan and other railways have been powerful agents in bringing matters to a crisis in this respect.

Here, then, considering the extreme value of land in those localities where accommodation is most urgently required, we come to the question of the best principles on which small tenements and single rooms can be grouped. And here we confess that to our idea the long-established practice of our masters in the building art deserves far more careful attention than it has met with in this country of late years. Since the rise of the monastic orders, the problem has been incessantly proposed to the Italian architect, how best to house a given number of persons, each of whom requires a chamber of absolute privacy—although for certain purposes common apartments serve for the community. It is true that this problem has been simplified by the restriction of the buildings thus required to the habitation of one or other sex. But this very restriction has rendered the subject more easy of study. Nor can there be any doubt that if, by way of experiment, we were to begin by making some model dwelling for several hundred persons of the same sex, there are thousands who would gladly find themselves on the list of candidates for admission.

In fact, the great monasteries and nunneries of Italy, more especially in the southern provinces, present a form of building as to the possibility of introducing which into our great centres of population it is worth while to make some serious inquiry. All that we actually need is to be found in some of these noble buildings. There is permanent protection from excess of weather; the more permanent and the more complete that these great houses must be built so as to resist any moderate shocks of earthquake. There is extreme convenience. There is admirable ventilation. There is every provision for health, for comfort, and for privacy. And within the lofty quadrangle a garden at once charms the eyes and purifies the air.

The considerations that oppose the introduction of this type of building into London are chiefly two. They are sentimental and financial. The latter, to our mind, is that which requires the greatest attention to meet. With regard to the former, we freely admit that the taste of the English people is opposed to that composite style of abode that is so familiar to our memory on the Continent,—not in monasteries alone, but in the great houses of almost every French and Italian city. It may be urged that an attempt, fairly considered and carried out, to introduce the system of "flats" into London has not had such success as to encourage repetition. All this has much truth. On the other hand, can any one contend that if we could offer to five hundred sempstresses, or five hundred young men engaged in mechanical industries, clean, weather-tight, light, warm, ventilated dormitories at something like a penny a night, there would not be numerous applicants? The only serious difficulty, we maintain, is the financial one. And this has two distinct aspects,—the construction and the remuneration.

It is, we suppose, a general, and probably a well-founded, opinion, among those persons who are familiar with buildings, that large, lofty houses, especially when we bear in mind the provisions of the Metropolitan Building Acts, are so much more expensive *per cubic* foot of contents, as to be economically inapplicable to such dwellings as we contemplate. We are not prepared to deny that there is room for such a view, irrespective of the question of ground-rent. But we desire to see the matter discussed, not as the subject of opinion, but on scientific and practical data.

One of the points as to which there is no doubt is, that a roof of immense span costs more per

square than an equal area of smaller roofs. The ratio, in iron roofing, has been held to be that the price per square is in proportion to the square of the span. But this cause of expense need not apply, as there can be no objection to the roofing of such a building as we suggest in very moderate spans and pitches.

Then comes the question of the thickness of the wall. Here the detail becomes too technical to be discussed without plans and drawings. But there is one consideration that should not be left out of sight. Increased cost, laid out in producing increased solidity, does not require proportionate increase of rents. It tells, in one respect, the other way. If, for instance, we build a house that may last for forty or fifty years, and receive 8 per cent. on the outlay by way of rent, a considerable portion of that percentage is not rent, but insurance. It is, or ought to be, a provision to enable the house-owner to renew the building at the time of its natural decay and downfall. But if, by increased solidity, the durability of the house be increased, a lower rent, in proportion to the outlay, will pay the builder. If, instead of having to rebuild *in toto*, say in sixty years,—which would be a long term for much of the house accommodation that is now being run up,—rebuilding would not be requisite for 200 years; and it would require no extravagant outlay to secure this,—5 per cent. might pay better than 8 per cent. in the former case. We have not space to pursue this inquiry farther, at the present moment. But we commend the subject to the consideration of our readers; and we recommend the careful collection of such data, with respect to the cost of large public buildings in this country, as compared with the structural advantages and cost of the great conventual buildings in Italy, as may tend to ripen our judgment as to the best method of solving a problem which we can very ill afford to neglect.

SEPIA PAINTING.

It is next to impossible for amateur artists (meaning by that term those who can only pursue art as an occasional recreation) in any way to compete with the work of trained and practised executants in the higher branches of artistic production, such as painting in oil or water-colour. In regard to the latter, this is more the case than ever, now that so much more elaboration of detail so much more minute imitation of nature, is practised than in the olden days of the art. Amateurs who take up these sections of artistic production must for the most part be content to be judged by a comparative rather than a positive standard, to gain the praise of showing feeling and perception of effect, without expecting that their productions can be accepted as satisfactory when judged by the same rule which is applied to the works of a professed artist, or claim to be hung in an exhibition on the same footing; unless, indeed, in rare and exceptional cases of original genius. But for those who would rather practise a form of art which they can render complete in itself, than hang on the outskirts of a higher and more elaborate art, there are processes which may be considered as especially adapted for amateur work; the chief characteristic of which is that their productions are valuable rather for the general idea and the degree of force with which it is carried out, than for elaborate technical finish.

Of this kind of process drawings in monochrome are the most important element, and few forms of monochrome work are more agreeable in their results, and less taxing in the manner in which those results are arrived at, than sepia sketching. The material presents an agreeable tone, and a certain degree of warmth, without producing a heated effect, and it is one that works readily and easily. In such a medium it is possible for those who have acquired or naturally possess an eye for form and for contrasts of light and shade, but who have little time for hard work in painting, to gain facility in producing studies from nature, or original studies of landscape or other effect, in a form which entails perhaps the maximum of effect in comparison with the labour bestowed,—which is the essential condition of amateur art under such restrictions. Many people of naturally artistic feeling, who are deterred from attempting the difficulties of water-colour, hardly know, perhaps, how much they could do in these simpler mediums, with pleasure both to themselves and others. To such we commend the art of sepia painting, as set forth in a very clear and comprehensive manner in a small book by Mr. R. P. Leitch*, consisting of tenty-four lithographed plates, illustrating progressively the possibilities of sepia painting, and accompanied by brief hints and instructions which show true artistic feeling, and a very exact perception of the capabilities and the limits of this branch of water-colour drawing. Such a book stands on a different footing from works intended to teach water-colour by progressive illustrations. The same author has himself, we believe, published a course of water-colour painting on the same principle, but which we should hardly recommend in the same way, because water-colour cannot, by any possibility, be adequately represented by chromo-lithograph, nor can anything be learnt of it from copying chromos, except in a hard, mannered, and conventional style, which had much better be let alone altogether. But lithography can represent monochrome drawings with almost the effect of the original drawing; especially in regard to what is the best use of sepia painting, the production of broad and free sketches of effect with little attempt at working up detail elaborately. When more than this is attempted, it is often a loss rather than a gain; for when too much realism of detail is aimed at by means of form and shading, the eye begins to demand the realism of colour also to complete the effect; but as long as the drawing only stands as a sketch, suggestive rather than realistic, everything is in its proper place, and the work becomes, if executed in a true spirit, entirely complete and satisfactory as far as it goes.

Mr. Leitch's instructions and hints are entirely in this spirit. In his general remarks, at the outset, he recommends the learner rather to avoid too much attempt at detail, the great charm of sepia painting consisting in the representation of masses of light and shade, "the result of which is breadth. The student must bear in mind that a picture represents the scene as a whole, as it would be impressed on the mind at one glance; and that, under such circumstances, no trifling details would be perceived, but that all the minor parts would be lost in the larger forms, which would again be blended into one harmonious whole, which would be disturbed were the details of any particular part rendered too prominent." In the more detailed instructions the author always keeps prominently forward the fact that painting of this kind is a system of *washes*, not of "outlines"; this is always one of the most difficult things to get into the head of young beginners, and in this view the study of sepia only might be an advantageous preliminary to the higher form of water-colour. At the same time, he is careful to insist on the necessity of accuracy and true perspective in the forms defined by the washes, either by applied colour or "spared-up" lights. The perfection of work of this kind is, in fact, to be able to draw or delineate with the brush alone, without previous outlining. It is only by considerable practice that this could be acquired, however; until it is, outlines must be made, but so as to be capable of complete obliteration, and removed as soon as the subject is defined sufficiently by the first washes of colour. Unless this is done, true aërial effect can never be obtained.

For the rest we leave Mr. Leitch's instructions in sepia painting to speak for themselves, merely adding that we agree entirely in his remarks and principles generally. The only thing for criticism is in the nature and forms of some of the earlier studies given; which are much such as we all know in many "first drawing-books." They serve the purpose of instruction in light and shade and general manipulation as well as anything else, but it is a pity that young students, especially, should be familiarised at the outset with (for instance) bad architectural detail, when good could be as easily drawn, and would give the same instruction in manipulation. Nor are we quite sure of the advantage of confining studies of this kind so much to objects presenting what is supposed to be a picturesque irregularity, that is to say dilapidation, of appearance. Objects of more finished and symmetrical form may be equally good practice in another way, and are often more difficult to draw; and the style of subject we allude to is calculated to give a false impression to the beginner that nothing is worth drawing but what is old and broken and decayed. Of the more advanced studies in the book we can speak with great satisfaction; Nos. xvi., xx., xxii., and xxiv. are especially good. We commend the little book to those who are minded to try a very fascinating form of art, in which much may be done even by those who have no large spaces of time at their disposal for such recreation.

* A Course of Sepia Painting; with twenty-four plates, from designs by R. P. Leitch. Cassell, Petter, & Galpin: London, Paris, and New York.

"THE UNIVERSAL ARTIST."

"He told us that he had been thirty years employing his thoughts for the improvement of human life. He had two large rooms full of wonderful curiosities, and fifty men at work. Some were condensing air into a dry tangible substance, ... others softening marble for pillows and pincushions, others petrifying the hoofs of a living horse. . . . . The artist himself was at that time busy upon two great designs: the first to sow land with chaff, ... the other was by a certain composition, outwardly applied, to prevent the growth of wool upon two young lambs; and he hoped, in a reasonable time, to propagate the breed of naked sheep all over the kingdom."

The Voyage to Laputa.

That this admirable being, who occupied a chair in the grand Academy of Lagado, is still represented in the western portions of Europe, has been recently shown by more than one characteristic effort of criticism. One of his descendants has lately declared in a letter to this journal that "painting and sculpture must dominate before architecture can become a great art"; and to understand this eminently striking assertion it should be remembered that in the academy before mentioned architecture was regarded as a pictorial art, inasmuch as a new method was contrived there for building houses by beginning at the roof and working downwards. But in countries less favoured than the kingdom of Laputa, true architecture has depended for its successful production upon a right and proper start, and upon the maintenance and development of traditions. In France and England the Mediæval master was given a certain problem or scheme, which he solved by the exercise of reason and common sense. He knew nothing of "true principles," and infinitesimally little of the orders of architecture. If, in his own way, he succeeded in accomplishing what the Greek had accomplished fifteen hundred years before, and if an analysis of the two systems proves identity in principle, it is because the minds of men, when they have been absolutely compelled to exercise them, are found to be constituted in pretty much the same fashion, even at different and remote periods of time. As a rule the course of true architecture runs smoothly for centuries; at length a crisis arrives, either political or religious, and the chain of tradition is severed. In the consequent confusion the broken links are scattered, buried, and forgotten. A period of comparative oblivion follows, of which history takes no note. Then a change comes, and the fire of energy is rekindled. A want arises and it is met by the simple exercise of mother wit: hence, the *naïveté* of early examples of what is now designated a style of architecture. The old story is yet new. It has been told in the lifetime of living men, when the sudden introduction of railways created new wants and new means of satisfying them.

The history of art in this country is the history of art in any other. Take a single illustration. When the nobles levied war on each other, and the vassals of one domain were pitted against those of a neighbouring one, it was necessary to command an easy and safe view of a broad expanse of country. Consequently lofty towers rose above the fortifications of a town, and these were as much a useful part of a fortress as battlements and curtain walls; and many a long siege and stout defence rendered them famous in story. At one perhaps a chieftain falls gallantly defending his castle against the foe. His grateful kinsmen wish to perpetuate his memory in some substantial manner; so at the base of the tower, in defence of which he fell, and in a sheltered corner, cunning hands carve his figure on horseback upon the stone wall; or perhaps a statue is prepared and inserted in the wall bordered with harmonious mouldings and covered with a graceful canopy. Then a chapel is built and dedicated to the saint whose day it was on which the chieftain died. Stories of the saint's life and death are painted upon the inside so that good Catholics may learn something of him who is to intercede for them with the Deity. This is art in a simple form, and up to a certain pitch of development it retained its early simplicity. All the arts which ministered to architecture were useful arts; and those of the sculptor and painter were then as necessary to complete

a building as those of the joiner and smith are now. But when Falconbridge the young baron of England, who, according to Portia, had "neither Latin, French, nor Italian," came back from his travels, in an odd suit, he brought with him the original progenitor of the universal artist; and the latter's descendants still buy doublets in Italy, round hose in France, bonnets in Germany, and,—Shade of the Poet, be lenient!—designs everywhere. They refuse to believe that shot and shell have superseded the grey-goose shaft, or that strings of wire are a better means of communication across country than any number of lofty towers. It was probably a son of the original universal artist who adorned some of the English cathedrals with sepulchral four-post monuments; and a great-grandson who "collected" in France and Italy the heads and wings of Cherubim and Seraphim which, their owner dying intestate, were ultimately stuck upon plain English walls. It was surely a member of his family (now nearly 300 years old) who suspended from English ceilings the sprawling saints of Verrio and Laguerre. The Egyptian Hall in Piccadilly, and the Pavilion at Brighton, were undoubtedly inspired by the prolific genius of his later descendants. In every new tower which serves no traditional purpose, in every spire which tells no certain tale, in every crenellated country-house, in every high-pitched roof with flat ceilings under it, in every traceried window with sash frames behind it, in many a new public edifice, in many an elegant drawing-room, the universal artist has had, not a finger, but a whole hand. Against all traditions, except those which have been definitely superseded by new inventions and discoveries, he strenuously sets his face. For him the time is always out of joint. His labours are prodigious, and he does not labour in vain. As far as this country is concerned no stranger can say with confidence whether a work of what ought to be technic art is of recent execution, whether it be brand-new, or a relic of centuries. The universal artist, in spite of all and every one, is pre-eminent; and the result is that in architecture the best new things are those which seem to be what they are not. In painting the result is,—a Royal Academy Exhibition. In sculpture, London. Thanks to the universal artist, instead of a perfect work of art, like Rheims Cathedral, France now produces a National Opera House in which painter and sculptor, regardless of scale or proportion, pile a Pelion upon Ossa of blank statuary and coloured mosaics; and a hundred artistic parallels can be drawn of similarly misdirected energy in this less naturally favoured land.

Nevertheless, it would be idle to ignore the wealth of love which is now expended upon works of painting and sculpture. This wealth a painter encloses in a gilt frame of more than dubious design, while a sculptor sticks his upon an old packing-case covered with red cloth. Each work ultimately goes to fill what is called a gallery: the one to be fitted in like a Chinese puzzle amongst a host of pictures of a totally different and incongruous character; and the other, life-size, and in a frock coat, to be placed between a diminutive Nymph and an Infant Samuel of Herculean muscularity.

It is not too much to assert that few men, however refined in artistic matters, can visit an exhibition of the Royal Academy, the walls of which are papered with pictures, without experiencing a sense of oppression, an incapacity to admire, a dread suspicion of being bored, the whole accompanied with a firm intention of submitting to any mental torture rather than acknowledge the truth. Happily, a catalogue, which is usually studied with more attention than is bestowed on the pictures, affords relief to the jaded eye. A careful observer has but to watch the vacuous stare of casual groups of visitors who have done only three rooms to realise the nature of the conflict which is taking place in their minds. But the sculpture galleries are a still more bitter satire upon the triumph of the fine over the useful arts. The pre-disposition to fly, which seizes upon an educated man when he finds himself face to face with an indiscriminate collection of "subjects" in every uneasy attitude and of all sizes is one result at least of the emancipation of sculpture from the parent art. Yet, so runs the obvious argument, painters and sculptors must exhibit their goods in order to sell them, and a red star becomes the summit of their ambition. Thus, by this singular process, a gentleman, a man of taste, a connoisseur, and travelled citizen of the world, who may have spent thousands of pounds over a new house, in which he has sought to have "everything in keeping," may perhaps be lucky enough to purchase such a pretty picture as that by Mr. Alma-Tadema in this year's exhibition, called the "Water Pets," which he will eventually suspend from a brass-headed nail upon the wall of his dining-room, between a hooded fireplace and a stained glass window!

The present relation of painting and sculpture,—promoted to be fine arts,—with architecture, a useful art,—may certainly warrant such a hypothesis as the following:—Suppose the St. Paul's Decoration Committee were to buy up all the pictures of sacred subjects and all the religious sculptures just exhibited in Burlington House for the purpose of placing them indiscriminately in the metropolitan cathedral, and therewith concealing the present staring baldness of the walls and arcades! Yet that is the way rich connoisseurs and others decorate their houses under the advice of the universal artist; and while this last-named irrepressible person holds sway any palpable change is impossible. There is, however, one man who can drive him from this country, and that is the patron who protects him; for the breed of patrons did not die out, as many suppose, with the great Lord Chesterfield. To such patrons it might be possible to say individually,—"If you have any intention of building a new house, or repairing an old one, spend a little time before doing so in getting up the subject of architecture as it has been explained by M. Viollet-le-Duc in France, and Mr. Fergusson in England, each of whom in remarkably clear language has corroborated the arguments of the other. Above all things, first commit to memory Mr. Fergusson's chapter on 'The Technic and Phonetic Arts.' Try and settle beforehand what you really want, and add, or even pull down, rather than restore. Collect the scraps of your own history, and that of your ancestors, if you happen to know of them; and remember that the smallest, and even a half puerile, incident connected with yourself will be as interesting to your descendants, and perhaps to the world six generations hence, as one six generations old, is now interesting to you. Such incidents form subjects for bas-relief, medallion, and frieze, and it is for you to tell your architect clearly the facts, in order that he may dress them up and frame them artistically. You may have written a book—who has not?—the plot or the substance of it can be rendered in stone or portrayed in colour. You may be a racing man, and the owner of celebrated horses; or a breeder of shorthorns, and famous at cattle-shows. You may be a statesman or a politician, and instrumental in passing certain measures which have contributed to the public good. Then take steps to record these facts upon the walls of your dwelling-house delicately and unostentatiously. Instead of buying 'Infant Samuels,' or pictures of some 'purling stream,' at chance exhibitions, perpetuate rather the remembrance of scenes dear to you, or linked with some association interesting to you and yours; for that is the way in which painting and sculpture appealed to men's minds when appreciation of both was spontaneous; and when architecture, of which both formed a part, was unaffectedly true and homely, and understood as clearly as an open book is at present by all classes of people."

It is happily unnecessary to assert the rights of the parent art over unruly and overgrown offspring. If it be worth while for a juvenile sculptor or painter to exalt his own art at the expense of architecture, some equally juvenile philosopher may rejoin, "*Et que sera donc la philosophie?*" The *Bourgeois-gentilhomme* was not more perplexed than wiser men had they been forced to discriminate between the rival claims of his professors of music, dancing, fencing, and philosophy. Perhaps, however, M. Jourdain may provide an answer to the question of how to rout the universal artist. The former desired to tell a fair Marchioness in the language of true gallantry that "her beautiful eyes made him die of love"; and after all sorts of ingenious transpositions of the same words he was surprised to find that the version which flowed, naturally, from his lips was deemed by his professor of philosophy to be not only the simplest but the best. Since the art traditions of this country were interrupted the forms and fashions of architecture have been transposed only to find out, after centuries of confusion, that the simplest are most befitting the national character. If painters and sculptors can revivify architecture by an ephemeral domination, by all means let them dominate; but they must select different subjects for the brush and chisel than it has long been their wont to do. Fine painters, however, should remember Lord Bacon's words, that "the best part of beauty is that which a picture cannot express." Nor ought the fine sculptor to forget that the efforts of some of his early brethren were made in countries in which naked beauty was and still is to be encountered. A Greek Venus loses some little of its dignity and sentiment when exposed to the inclemencies of a leaden sky. If the painter can afford at times to dispense with artistic surroundings and remain independent of the architecture against which his work reposes, a sculptor surely cannot. If both will study architectural laws they will help their own arts even if they do not raise architecture. Some modern painters of eminence have failed even to draw a round or pointed arch in true perspective, and of late years hardly any British sculptor has succeeded in making a really successful pedestal to support often a less successful statue.

In conclusion, it has been, until very lately, a self-evident proposition that all work of whatever kind must be directed by some one. Common sense has also demonstrated that there is little or nothing in a name. It is of small importance in the building art whether the master-of-the-work be a sculptor, painter, or modern architect, provided he possess knowledge enough to direct the work. Even the universal artist cannot transpose this admission by any "nice derangement of epitaphs"! Although very little is known of the antecedents of mother Earth, it is at least clear to a few who have used their eyes that existing upon its surface are substantial records,—relics of a period of more than two thousand years,—which prove beyond doubt that in works of true architecture painting and sculpture have held a place proper to each; that they have been set therein to tell some cognate tale of history or romance; and that where they have strayed beyond certain limits the general effect of the work has been marred.

> "'Tis not a lip or eye we beauty call,
> But the joint force and full result of all";

and to obtain that "full result" in architecture has depended, and still depends, upon him who, higher than the painter and sculptor, "contributes knowledge but not manual labour."

LYMNE AND THE ROMANS.

At the recent meeting of the Kent Archæological Society, Lymne was visited, and Mr. Roach Smith was called on to describe and account for the massive ruins seen around them. He said the broken and overturned walls formed the castrum or fortress erected by the Romans near the old *Portus Lemanis* to repel the invasions of the Franks and Saxons, who, towards the decline of the Roman Empire, made continual descents upon the nearest parts of the coast of Britain. It constituted one of a series of forts from Brancaster, in Norfolk, to the Adur, in Sussex, a tract called the *Littus Saxonicum*, or Saxon shore, from, as he believed, the aggressions of their forefathers, the Saxons; and not, as some maintain, from their having established settlements; part of the opposite coast of Gaul was also called the Saxon shore. It was by fortresses such as this, connected by roads, and divided only by the Channel from the great military way which led to Rome itself, that Britain was retained so long as an important province of the Roman Empire, supplying precious tribute, and receiving in return arts, sciences, and civilisation. While the *castra* they were now examining (Richborough and Lymne) were of individual importance, yet they must be studied as a part of this great military occupation of Britain, in order to estimate fully, and understand the mechanical means by which the Romans secured their conquests. They belong to the early history of our country, and are indispensable to it, especially in connexion with inscriptions, of which nearly a thousand have just been published by Dr. Bruce in his "Lapidarium Septentrionale," and these are wholly confined to the North of Britain. Among those he (Mr. R. Smith) had the honour of addressing was Mr. Parker, fresh from his valuable researches in Rome, and stored with her grand monuments; yet, he felt convinced, Mr. Parker estimates the remains of Britain as historical evidence, quite as highly as those of Rome itself, infinitely superior as the latter are as works of

art. For the future histories of our country these monuments will supply materials hitherto neglected; but time was limited, and he must confine himself to the place before them. Mr. Roach Smith then proceeded to assign reasons for his conviction that these *castra* on the Saxon shore, are of comparatively late date. One of these is the absence of inscriptions. Those on the line of the Great Wall, which date from the time of Hadrian, as well as the places where the legions were quartered from a more remote time, had supplied many inscriptions of more or less historical value. Not so the fortresses on the Saxon shore. We know from the *Notitia*, a late work, giving a full account of the distribution of the military forces throughout the entire empire, the various bodies which garrisoned them; but we have no lapidary documents to confirm and extend that information. Dover had Tungrian soldiers, drawn probably from the north of Britain, like as the second legion was moved from Carleon to garrison Richborough. Turnacenses, from the region of Tourney, were stationed in the castrum, within the walls of which they were, at that moment, assembled; but at present no records of their doings had been discovered. Yet there has been found during excavations which he and Mr. Elliot had made, some years since, evidence which did not bear upon the station itself so much as upon the *Portus Lemanis*. This was from inscribed tiles, and from an altar. The former were not tiles which had formed the bonding courses of the walls, but they had been used in some of the buildings or barracks within. They were stamped CL.BR. which he (Mr. R. S.) had explained; and the explanation is allowed as meaning "Classiarii Britannici," or British Marines; and similar tile stamps have been found at Dover. The altar was dedicated by a Præfect, or Admiral, of the British Fleet, to some deity whose name had been effaced in consequence of the altar having been brought from the place of its original destination, and used as a foundation-stone of the chief gate. He believed it had been brought, together with the tiles from the *Portus Lemanis*, now filled up and dry ground. Upon it, as well as upon other building stone, were incrustations of marine shells, showing that at a former time they had been submerged in the sea, or subjected to tidal action. The *Portus Lemanis* and its buildings had probably experienced some great change when this castrum was built. Mr. Roach Smith then briefly described the character of the castrum, the buildings inside, and the cause of their overthrow.

Mr. Dowker inquired upon what authority was it concluded that the site indicated was that of the *Portus Lemanis*.

Mr. R. Smith replied, chiefly the Itinerary of Antoninus; and the *Notitia*. The distance from Canterbury as given in the former, by what is now called the Stone-street, confirms it, and the position of the castrum as indicated by the *Notitia*. Concluding with urging the importance of studying the natural features of the country as well as the ancient remains, he directed the attention of his audience to the long-debated and contested question of the landing of Julius Cæsar, observing that having visited Richborough, Sandwich, and Lymne, they would be better qualified after their meeting at Dover to form a correct opinion; and to judge from what Cæsar himself has written, and from the features of the country, as well as the sea coast, whether the flat and open place where he effected a landing was Deal, or Folkestone, or Lymne; and to which place the required river at the foot of high ground, and the distance of sixty miles to the Thames would the better apply.

THE HOUSE OF THE LONDON SCHOOL BOARD.

At the meeting of the Board last week, a statement of the cost of the new offices on the Embankment, designed by Mr. Bodley, was brought up. The site cost 18,552*l.* 8s. 8d. (inclusive of legal expenses). Three tenders, the aggregate amount of which was 20,473*l.*, were accepted on the 5th February, 30th April, and 28th May, 1873, for putting in the foundations and for erecting the buildings. Finally, on the 8th July, 1874, the committee were instructed to take the necessary steps for "completing the fitting up and furnishing" of the offices. The cost of the fabric of the building has exceeded by 2,741*l.* the amount of the tenders accepted, and the additional 10 per cent. authorised by the Board in the case of all contracts. This excess has been caused by the variations in the original plan which it was found necessary to make during the construction of the building. As to the infringement on the lights of the adjoining owners,—in the case of Messrs. Woodfall & Kinder's claim, the arbitrator appointed under the seal of the Board to determine the compensation to be paid has given his award for 1,200*l.*; and, in the case of Messrs. Gwynne's claim, the committee thought it advisable to agree to a payment of 100*l.* and 21*l.* costs, in order to avoid litigation. The total cost of the site, building, and furniture, with all incidental charges, is 60,423*l.* 19s. 5d.

For this large expenditure the ratepayers have obtained the ugliest piece of affectation to be found in the neighbourhood,—a flimsy "front" inharmonious and ill-proportioned.

In the course of the discussion which followed the statement as to cost, some of the members eagerly repudiated any responsibility for the building, and one (Mr. Lafone) protested against any expenditure for the decoration of the board-room, which he described as simply insufferable, no one but the chairman, and the chairmen of committees, who sat near him, being able to hear what was going on.

ESTIMATES OF FURTHER RAILWAY EXPENDITURE.

A statement has been issued as to the estimated further expenditure during the next and succeeding half-years which will be required by sixteen of the leading railways, on lines open, on lines constructing, and in working stock, from which it appears that the aggregate sum which will have to be expended in capital for these purposes, amounts to the enormous sum of 34,183,753*l.* The London and North-Western Company stands at the head of the list, the figures showing that its expenditure will be 6,353,846*l.*, of which 2,900,000*l.* will be on lines open, and 3,143,225*l.* on new lines now in course of construction, together with 256,000*l.* on working stock. The Great Northern Company is next in order, their intended expenditure being 4,457,545*l.*, namely, 749,807*l.* on lines open, 3,428,318*l.* on new lines in course of construction, and 279,421*l.* on working stock. The Midland Company follows with an expenditure of 4,081,538*l.*, of which 654,588*l.* is on lines now open, 3,267,950*l.* on new lines in course of construction and 159,000*l.* on working stock. The North-Eastern Company's estimated expenditure is 3,381,262*l.*, of which 565,663*l.* is on lines now open, 2,420,199*l.* on new lines in course of construction, and 395,400*l.* on working stock. The estimated expenditure of the Caledonian Company on these several heads is 2,755,177*l.*; of the Lancashire and Yorkshire Company, 2,702,835*l.*; Great Western, 2,654,255*l.*; Manchester, Sheffield, and Lincolnshire, 2,110,000*l.*; London and South-Western, 987,100*l.*; Great Eastern, 950,000*l.*; Glasgow and South-Western, 782,749*l.*; North British, 602,600*l.*; South-Eastern, 442,720*l.*; London, Chatham, and Dover, 348,130*l.*; London, Brighton, and South Coast, 331,196*l.*; and Bristol and Exeter, 242,800*l.*

ATTACK ON THE EXPLORING PARTY IN THE HOLY LAND.

We referred briefly in our last number to the report which was in circulation as to the attack on Lieutenant Conder, R.E., and his party, engaged in the survey of Palestine, which was said to have taken place at "Japhet," a place unknown to topographers. In the first telegram, dated Constantinople, July 23, it was so uncertain whether it was announced that *nine* of the party were wounded, or that *none* of the party were wounded, that contradicting readings were sent out from Reuter's office. In a subsequent telegram, the same slovenly obscurity prevailed. The word was then spelt NUNE, and there was another word entirely undecipherable.

Further particulars have now been received at the office of the Palestine Exploration Fund; and the honorary secretary, Mr. Grove, has published an account. A full report is also on the way to the Foreign Office, from the Consul at Beyrout. It appears that on the 10th of July a ferocious and entirely unprovoked attack was made on the exploring party by the inhabitants of Safed. The range of the Jebel Safed is the highest ground in Palestine, forming the western limit of the Ghor, a remarkable depression through which the Jordan runs, linking the three lakes of Merom, Gennesaret, and the Dead Sea. The town of Safed, which is conspicuous from a great distance, is considered to be referred to in the Gospels as the "city set upon a hill." The natives are zealous Moslem; and Safed is nearly as holy a part in the north of Palestine as Hebron is accounted in the south. When surveying near Haifa, in 1872, Lieutenant Conder's party was fired on by some of the natives, and considerable precautions were taken on the return of the party to this wild vicinity in the present summer.

The attack appears to have been violent. It was entirely unprovoked. The little party must have been overwhelmed by numbers, but for the arrival of the Turkish troops. Lieut. Conder then retired to Haifa, with eight of his party wounded. Malaria fever has also attacked the officer in command, but on the 1st of August all were reported as doing well.

The consul reports that measures are taken for the arrest and punishment of the assailants. The Foreign Office has taken the matter in hand. We hope that a proper compensation to the wounded will be insisted on by Lord Derby. Such a step will prove of far more service in the protection of English travellers and official residents in the East than any amount of personal chastisement inflicted on the ringleaders. It is quite consistent with Oriental habits to yield up the individual denounced, to prison, bastinado, or anything else. Such a description of punishment will be regarded with little interest,—except by the ruffians themselves. But an adequate fine imposed on the district will come home to every inhabitant. It will strike far more alarm through Syria and Turkey than any other description or means of redress can do. And it will do much to restore the English prestige, and to prevent Englishmen who are exposed to danger in Mohammedan countries from envying those Europeans who enjoy the protection of the French, the German, or the American flags, which is at present but too notoriously the case.

SALE OF CHALK LANDS AND CEMENT BEDS.

A numerous company connected with the manufacture of cement, and those belonging to building pursuits, was present at the Mart, Tokenhouse Yard, on Thursday week, when the Stone Court estate at Greenhithe, on the banks of the Thames, containing an area of 99 acres, was offered for sale by auction, by Messrs. Fuller, Horsey, Son, & Co. The property was described as containing a most valuable tract of chalk land, with beds of cement, mud, sand, and gravel. The quality of the chalk was said to be of the best description, and a large trade was now being done in supplying chalk to cement manufacturers. A bed of sand and gravel, extending over about eight acres, having a depth of 30 ft. above the chalk, had been opened. The sand was a sharp grit, available for building purposes, and was now said to be commanding a large sale. Adjacent to the river 28 acres of the land contained a natural deposit of excellent cement mud, equal to the Medway mud deposit, so that all the requisites for the manufacture of Portland cement on a large scale were on the property. It was further stated that a pier and a railway 1,200 yards in length had been constructed on the estate at an outlay of 20,000*l.* Mr. Horsey, the auctioneer, made an explanatory statement as to the great value of the property for the manufacture of cement, and for other purposes. He stated that he valued the property at 78,000*l.* as a minimum, and he endeavoured to show that any one who purchased it at that price would realise from it an annual income of 5,000*l.* a year at the least. The biddings then commenced, the first offer made being 50,000*l.*, and by advances of 500*l.* at each bidding the property was rapidly run up to 67,000*l.*, when the biddings slackened. Ultimately, the property was bought in, as there was no further advance beyond 67,000*l.*, but it was stated in the room afterwards that the property had been purchased privately for over 70,000*l.*

Gloucester.—The enlargement of the rectory-house of St. Michael's, in this city, has been commenced. The residence will be extended by the addition of a wing in the ground occupied as a nursery by Mr. J. Bond. Mr. Albert Estcourt is the builder, and Messrs. Waller & Son are the architects.

GRINLING GIBBONS AND HIS WORKS.

The early life of Grinling Gibbons affords a notable example of the irrepressibility of genius. He studied under no great master, he received no elementary instruction from a school of art, and yet Evelyn found him in a cottage near Sayes-court, Deptford, copying in wood, with exquisite taste and skill, an engraving of Tintoretto's "Crucifixion."

Contrary to the generally received opinion, the great carver was born at Rotterdam, April 4th, 1648, and not in Spur-alley, in the Strand. This fact was placed beyond a doubt by the discovery by Mr. Black of his horoscope among the Ashmolean MSS., at Oxford, cast by Elias Ashmole himself. There was a Simon Gibbons employed as a carpenter by Inigo Jones, who may have been his father.

Evelyn, June 18, 1671, introduced "the incomparable young man," as he calls Gibbons, to Charles II., and thinking the subject of the carving from Tintoretto would please the Queen, showed it to her Majesty. She would have purchased it, had not one of her attendants made deprecatory remarks, and the carving was taken away, and its present possessor is not known. One other carving of a like character, happily in existence, was purchased by Charles II. It represents the "Stoning of Stephen," and the seventy figures are remarkable for their artistic feeling. The architectural portions of the design and other subsidiary features are of exquisite character, and, unlike Gibbons's carvings in general, this superb work of art is in perfect preservation. Charles II. presented the carving to the Duchess of Chandos, and it was taken to Cannons, in Hertfordshire. That mansion was pulled down a hundred and fifty years ago, and the carving was purchased by Mr. J. Gore, who placed it in his house at Enfield. His descendant, Mr. J. Gurdon Rebow, removed it to Wyvenhoe Park, near Colchester, where it still remains,—the most important Gibbons carving in existence.

We now turn to the carvings executed in his distinctive style,—fruits, flowers, game, &c., among richly-diversified foliage. Fortunately, many examples exist in the mansions of England to testify to his matchless variety of treatment. Few data enable us to mention these in their chronological sequence, but we will notice those first the dates of which have been ascertained.

The carvings at Cashiobury, the seat of the Earl of Essex, were executed *circa* 1675. Evelyn, in his "Diary" (April 16th, 1680), says:—"On the earnest invitation of the Earl of Essex, I went with him in his house at Cassioberie, in Hartfordshire. There are divers faire and good roomes, and excellent carvings by Gibbons, especially the chimney-piece of ye library." Unfortunately these beautiful carvings have been injured by paint and varnish. They were in perfect condition as late as 1835!

The following entry appears in the accounts of works at Windsor (October 1st, 1680, to September 30th, 1682):—"Grinling Gibbons, carver for an extraordinary fine piece of carved work, made and carved by him for his Matie and sent by his Matie as a present to the Duke of Florence, 150*l*." It appears from the same accounts that he then was in receipt of a pension of 100*l*. per annum. Mr. W. Watkiss Lloyd identified this carving with one now in the Ducal palace at Modena. He says it consists of "fruit, corn, flowers, shells, in great variety, combined and festooned among mere ornamental foliation. The centre is formed by a skull, executed with the greatest detail,—a music-book open, with music and words, and musical instruments. From a round linked chain, which passed round the skull, hangs a medallion, with a three-quarter face of the artist, and inscribed "Gibbons, inventor, sculpsit, Londia." So far as we know, this is the only example of Gibbons's work in existence which bears his name and the amount paid for which is ascertained.

To 1684 belongs the altar-piece at St. James's, Piccadilly, Evelyn saw it December 16th of that year, and remarks in his diary, "I went to see the new church at St. James's. Elegantly built. The altar was especially adorned; the white marble enclosure curiously and richly carved; the flowers and garlands about the walls by Mr. Gibbons, in wood; a pelican, with her young at her breast, just over the altar, in the carved compartment and border. There was no altar anywhere, nor has there been any abroad, more handsomely adorned." Two Italian artists were allowed to restore this thirty years ago, and replaced some of Gibbons's work by their own.

In 1685-6 he received 340*l*. 17*s*. 9*d*. for "carving the crown, sceptre, and tassell, with nine bosses of wood over the canopy, and for vallens, festoones, cornishes, and other carved work, for the front of the organ, for the tabernacle and all its relieves, and fourteen figures in the chapel; for a marble holy-water pot, and for a chimney-piece in the Great Bedchamber, and another in the Little Bedchamber," at Whitehall. For carving the great altarpiece of white marble with Arnold Quellin, they finding all materials, he received 1,875*l*. 1*s*. 8*d*. Ten years after the altarpiece was taken to Hampton Court, Gibbons receiving 130*l*. for its removal.

From October, 1691, to March, 1696, Gibbons received 839*l*. 0*s*. 4*d*. for "work done in the new gallery building, in the king's great and little closets, in three rooms under the king's apartment, in the king's gallery, and other places," at Kensington.

To the last decade of the seventeenth century belong the carvings in the Cedar Chapel, Chatsworth. On the high authority of Mr. W. G. Rogers we ascribe these to him; but it is perfectly certain that the beautiful carvings in the State dining-room, though usually assigned to Gibbons, are not by him; for in the original book of work is a memorandum of agreement, dated September 9th, 1692, by which Joel Lobb, William Davies, and Samuel Watson, for the sum of 400*l*. agreed to execute in lime-wood "the carving of the great chamber, to be done equal to anything of the kind before executed," and not only so, some of Watson's designs are preserved (Hall & Jewitt's, "Stately Houses of England," p. 368). At any rate, these works are worthy of Gibbons.

We have seen how busy Gibbons was elsewhere about that period, and it is probable he came little to Chatsworth, but found time to prepare the Cedar Chapel carvings in London. Considerable sums are charged in the books of account for carriage of "carved work," &c., from London, and it is only in this way that we can account for his name being traditionally connected with Chatsworth. There is one piece which must be mentioned, carved in a style in which Gibbons is known to have excelled. By common consent the carving,—a cravat of point-lace, a woodcock, medal, and foliage,—is called his masterpiece. It is preserved in the State dressing-room, and Walpole says Grinling presented it to the duke when he had finished the carvings which he executed at Chatsworth.

Before noticing carvings, to which no dates can be assigned, we may observe that he executed in marble the statue of Charles II. for the Royal Exchange; the tomb of Baptist Noel, Viscount Camden at Exton, Rutlandshire (cost 1,000*l*.); the font at St. James's, Piccadilly; and probably that of St. Margaret's, Lothbury.

The beautiful carvings at St. Paul's belong to the concluding period of his working life,—the reign of Queen Anne,—at whose accession he was fifty-four years of age. Mr. Boutell, in a paper in the *Art Journal*, Jan., 1865, illustrated by beautiful engravings of these carvings, observes that they may be classed in five divisions,—flowers and foliage in naturalistic combination; panels of arabesque design, with strictly conventional foliage; mouldings in which foliated members of the design are more prominent; carvings enriching architectural construction; and, lastly, combinations of all these varieties. We commend these remarks to students,—"Our carvers of wood require long, profound, and thoughtful study of the conventional, and also of the natural, in their art. They need to observe what effects result from every modification of natural treatment, from every combination of natural with artificial and conventionalised forms, and also from the direct action of positive conventionalism, and this observation must extend to treatment, to execution, and touch, and finish, as well as to design, and composition, and aggroupment." Malcolm has a curious account of the payments made to Gibbons for his work at St. Paul's (iii. 105). It appears that he received altogether 1,337*l*. 7*s*. 5*d*.

The chapel at Trinity College, Oxford, contains the finest Gibbons's work in either university. This exquisite work, executed in lime and cedar, has in some parts been painted, and in others treated with an undrying oil. Skelton, in his work on Oxford, engraves two inferior carved pendants instead of the exquisite work at the east end. The chapel was built in 1691, and consecrated three years after. The library at Queen's College, Oxford has good carving in Norway oak attributed to Gibbons. A good deal of the delicate work enriching the presses has been injured from its exposed situation.

The projecting bookcases at Trinity College Library, Cambridge, are enriched with carvings in lime by Gibbons. Of better character are the panels at the end of the gallery, the door-heads, and arched recesses. But all these appear to have been painted, and indications are not wanting to show that the imprisoned insects are working sad havoc within.

At Kirtlington Park, Oxford, the seat of Sir H. W. Dashwood, bart., Mr. Rogers found two of the largest Gibbons's panels he had ever seen. One of these, in the great hall, are from 5 ft. to 6 ft. square,—a fine composition of dead birds, fish, shells, and wild flowers. Mr. Rogers's experienced eye saw that the insects within were reducing this work of art to rottenness. On the grand staircase is another panel having a basket of flowers and fruit, with side pendants, about 5 ft. by 4 ft. There are other carvings by Gibbons in this house.

The carved dining-room at Petworth House is enriched with a superb series of carvings. This room is 60 ft. by 24 ft., and is, as Walpole wrote to Montague, August, 1749, "gloriously flounced all round with whole-length pictures, with much the finest carving of Gibbons, that ever my eyes beheld. There are birds absolutely feathered; and two antique vases, with basreliefs as perfect and beautiful as if they were carved by a Grecian master." It is stated that Selden, one of Gibbons's assistants, lost his life in saving the carvings when the house was on fire. Ritson restored them about forty years ago. These carvings are in Gibbons's best, or naturalistic, manner, and the rich festoons of fruit, flowers, shells, birds, &c., hang between the pictures in this magnificent apartment.

A good deal of Gibbons's work is scattered over the rooms at Lyme Hall, near Disley,—a house rebuilt by Sir C. Wren. It is in the style of that master, but as there is a tradition that it was executed by persons employed at Chatsworth, it may have been done by Watson and his assistants. The rich series at Belton House (Earl Brownlow's) were restored by Mr. Rogers in 1855, or ten years before he similarly treated those at Chatsworth. In this paper we have only alluded to typical examples. Other mansions,—as Sudbury Hall, Derbyshire, and Melbury House, near Dorchester,—have good specimens of the great master.

The reredos of St. Nicholas's, Abchurch-lane, having large masses of festoons and pendants of fruits and flowers, has been painted over in the same way as the work at St. James's, Piccadilly, and other places. The enrichments in the hall of the College of Arms were undoubtedly executed by Gibbons, for his receipts for the various payments are preserved there. We may also mention that Mr. Newdegate has his original accounts for the carvings done at Harefield Church.

The carvings from 108, Cheapside,—Sir Edward Waldo's house,—were purchased in 1861 by Mr. M. C. Jones, of Gungrog, near Welshpool, and fitted up in that place. Mr. Jones has written a pamphlet in which he attempts to prove,—and, I think, with success,—that they were the work of Gibbons. They are remarkably like the Heralds' College carvings, and the house was built between 1669 and 1672. One of the most recent works of the late Mr. W. G. Rogers was a sideboard to place in the room filled up with the carvings at Gungrog. The back has a scene representing Charles II. knighting Sir E. Waldo on the occasion of his visit to the City in 1677.

Two examples of Gibbons's exquisite point-lace work, besides the example at Chatsworth, are in existence. The finest of these graced Horace Walpole's collection at Strawberry Hill, and is now in the possession of the Baroness Burdett-Coutts. Mr. Rogers found another specimen at Cullen House, Banffshire.

When at the height of his fame Gibbons was appointed by George I. his master carver at the munificent salary of 30*l*. per annum! The great carver died August 10, 1720. He had nine children, but it does not appear that any followed in the artistic footsteps of their father.

John Piggot, F.S.A.

Monument to Clarkson.—Wisbeach is about to erect a memorial of Clarkson, who was born there,—a tardy tribute, but better late than never. A design for it has been obtained from Sir G. G. Scott.

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THE PRESERVATION OF OLD MONUMENTS, AND WHAT TO AVOID.

"Better late than never," is, certainly, speaking ever so generally, a most capital proverb, and when cited specially, it is sometimes found to be more than ever to be commended, and, if possible, acted out and practically illustrated. And right fortunate it is when it is uttered in time. Never was it more to the purpose, or was it more to be desired in its practical applicability than at this moment, when the attention of the British world of art, at least, is being powerfully, and in many ways, called to the important subject of the "preservation" of our ancient monuments and memorials of past times. It would be quite impossible to overrate the importance of this movement; and there may be further good done, and the *progress* of the good work urged, by a glance at, and a few thoughts on, some of the less understood phases of this subject of our ancient monuments and practical deeds and works of our forefathers,—of those who have preceded us in life's race. What is an "old monument"? Is it better or worse than a *new* monument? for monumental and memorial work is always and perpetually going on, and what is new to-day is old to-morrow, or next year, or next century. And why should it be desirable to perpetuate an old memorial, and one of past times, and modes of thought, and action, and work? Questions worth a little cogitation.

So important, indeed, is this problem of the preservation of old things, and even of the *sites*, in which they have been found, and on which deeds have been done, thus making of the mere ground itself an antiquity, and, old as it is, more ancient still; that we have been usefully reminded by a great authority that the greatest of antagonisms have been those which have been aroused by the highest and deepest sentiments by such, indeed, as are associated with the "antiquities" either of race or society; and certainly not least, though it may be last, of those "material antiquities" which remain to us, or ought to have remained to us, in the shape and semblance of memorials in stone. Sacred spots must needs have sacred stones,—marble or limestone. What would the world be were these all to suddenly crumble into dust, and to disappear? In this metropolis it is affirmed, there are antiquities, memories of the past, daily dug up, only to be buried again, or destroyed; but that even as this is, there will be enough remaining for the curiosity of many future ages. Not a corner of this island but in it, or near to it, may be found remains,—memories in earth or stone, quite enough to feed the antiquarian proclivities of most men.

It would be a right curious subject of inquiry to find out, with any certain approach to accuracy, which among the many yet existing remains in these islands, is the "oldest memorial." Where and which is the oldest and first built-up stone or earth mound, of stable form and dimensions, erected by the spirit and hand of man here in these islands, and who were they who built it up, and what was it for, and why was it done? Who was its superintending architect? and what "precedent" had he, if any? If none, how did he get to work?

These considerations, and such as these, are well worth the thought of those who will one day,—almost too late, we fear, in many cases,—legislate to "preserve" our old memorials of the past, or such of them as can now, after so much injury has been done, be cared for. We should be disposed, considering how important an influence even words have on human actions, to substitute for the phrase "preservation" of old memorials: the clearer idea, however conveyed, of letting them alone, or fencing them round. A most momentous consideration is this if we but come to think of it with any sufficient attention. Not a few thoughts come before us as we look into the subject-matter of it. All know how the word and idea of Restoration have been the subjects of controversy for a long time, and how far pushed to extremes has been the idea of "restoring" ancient remains, and monuments of the dead past; and how not a few of them have thereby been utterly and for ever blotted out and destroyed!

Stonehenge, even, to begin with, the roughest and hugest and most mysterious, has been proposed for restoration! From Stonehenge downwards, where is the monument which has not yet been at least threatened with restoration? That the restoration days have passed away we cannot affirm; but the force which the idea once had is lessened, and the word and idea of preservation are gradually and surely, though somewhat slowly, taking its place. To preserve our national antiquities is now the aim of many who but a few years back would hardly have cared to meddle with the subject at all. But, "better late than never."

There are so many aspects in which this now momentous subject may be looked at, that we hardly know which of them is the most pressing and most needful of thoughtful care and consideration. We had almost come to the conclusion that the one thing most needful of pressing on the consideration of those who are likely to be the most active in this matter when we have a "law" will, and needs must, be a clear definition, of hard though perhaps popular and well-known terms and phrases. The very *word* "preservation," to wit, is a long word, and admits, as far as old things are concerned, a multitude of meanings. What is it, for example, to *preserve* the remains of an old Norman castle or keep, or an old abbey wall, and two or three straggling columns, supposing such to be found somewhere or other intact, and just as time and the elements have mercifully left them, half-buried, it may be, in accumulated and heaped-up earth, with weeds and rank grass everywhere about them? In such a state as this it seems almost a pity to in any way disturb them or to touch them. Time and the elements have done their work wholly, almost like living intelligences. It has taken old Father Time some centuries, may be, to accomplish his task, and he took it up as soon,—the very same day,—as the human and caretaking occupants of the place left it or were driven from it. Time here was the second workman, and has done his own work in his own way, and it seems almost a sacrilege to disturb it. Some will urge the digging out of moulded plinths, pavements, *et hoc genus omne*, and to get sight of even methods of foundation building; and it may be hard to dispute with them. We are inclined to think that much should be left to the "imaginative faculty," and to the fact of such ruin being left to show itself to be what it really is,—a ruin and nothing else, either more or less. The hand of time, ever at work here as everywhere, has been the workman, and made the thing what it is; and it is his work, in addition to the purely human work that rouses the souls and thoughtful faculties of those who wander to the spot to gaze upon the twofold work. If indeed anything in the way of real restoration is to be done, and the place again sought to be reinhabited and built up again, and made again humanly useful, why then Time's work must needs be itself destroyed, and the human workman become again master. It is not a little easy, and perhaps tempting to do too much, and in the very effort to take care of the old monuments, and to exhibit them, there is no small fear of the very monument or past memorial itself being lost in the careful and well-looked-after surroundings of the place whereon it stands. Mentally and poetically this is to blot it out, and it would be almost better to do as was always done in days gone by, viz., to pull down and do away with altogether, and to build up again in the style of the hour and day, a new building, making all convenient use of the old and worn materials. This was the case at York, as elsewhere, when the old Norman materials, carved work included, were built into the new Early English work.

But of all the truly unfortunate ways whereby an old monument, wherever it is, may be marred, and the romance of it taken well out of it, it is by the process of taking too much and over care of it, and by, "so to phrase it, "cultivating" it. This is worth noting by those who are interested. At the good and archiepiscopal city of York there are the remains of St. Mary's Abbey, quite enough of the old work to well indicate what a goodly pile of architecture the Abbey once on a time was, before "improvements," and before time's work had been so far blotted out. It must have been sufficiently striking and impressive. These ruins are not, it is true, "restored," but the ground in and about them has been smoothed and levelled, and, as far as is possible, converted into a small and neatly-arranged garden, with flower-beds, gravel walks, and neatly-divided plots. Nothing, as it would seem, can be better, and with, in addition, garden seats at convenient spots from which to gaze upon, and, if you like, to sketch the ruins of the old Abbey. Most surely nothing could well be done more effectually calculated to destroy at a blow all idea of a ruined and depopulated building, and to eliminate from the spot all sense of its being deserted by its once teeming occupants. A ruin surely while it is a ruin should be left to show itself as such, and no attempt made to make of it anything but what it is. The charm and poetry of it lie in its very desolation, and in the sense of its very wasted strength, and the way in which nature comes in and occupies the desolate spot, and sows in her own wayward way,—so inexpressively attractive always,—the "weeds" and grass. It is not most surely to be bettered by the sweeping all these away.

Among these, and perhaps not a few other cautions, there is one other not a little worth taking to heart. We may even wonder that any caution can be required. We allude to the cultivation, for it amounts to that in not a few instances that we could name, of that wonderfully picturesque plant—ivy!—poetical, picturesque, architectural, and all that is good. But you may have always too much even of a good thing, and you may certainly have far too much of "ivy." It may totally conceal the very ruin, or building, it was meant to add a charm to. We well remember a fine ruin, or rather a bit of one, in the Isle of Wight, so entirely smothered with ivy that it was impossible, without pulling a portion of it aside to see what was beneath it, whether stone, or some artificial Vauxhall Gardens construction, purposely built up to support the huge mass of green leaves. It would be, as we take it, impossible to do a worse thing than to over "cultivate" such a plant as ivy. It requires not a little restraint and occasional pruning, or rather cutting away, to prevent its getting the entire mastery, and fairly burying the building or ruin outright.

We have thus thrown together a few hints on this important subject, and can but earnestly hope that good will come of the present desire to care for and mentally utilise our ancient memorials,—memories of the dead past, and of those who once lived and acted out their part, at times so manfully and so well, in this world's work and life. They have surely left a something behind them, and we are bound to care judiciously for it.

THE BASILICA OF ST. CLEMENT, ROME.*

We come now to the description of the basilica itself, from which we omit, at any rate for the present, all accounts of the frescoes, as they are not technical and somewhat fulsome.

"The basilica consists of a nave, two aisles, and a narthex. Its entire length is 146 ft. The nave is 52 ft. 3½ in. wide; the width of the northern aisle is 18 ft. 6 in., and that of the southern 13 ft. 10 in.; the narthex, which runs the whole width of the church is 91 ft. 8 in. From the narthex we enter the north aisle, which is divided from the nave by a line of seven columns of various marbles, embedded in a wall built for the most part of the *débris* of ruined temples and broken statues. These columns are 12 ft. high and 1 ft. 6 in. in diameter; and all stand in their original positions. The first, of *verde antique* is of marvellous beauty, and very remarkable for its vermilion spots, varying its surface of vivid green and pure white; it is considered a unique specimen of its kind in Italy. The second is Parian; the third and fourth are Numidian marble; two others are of Oriental granite, and the seventh of *settebasi* of the rarest quality. Some of these pillars have been stripped of their capitals, others retain them, and, although all are valuable and beautiful, they lack uniformity both in height and diameter, which shows that they must have been taken from still older edifices, perhaps porticoes of Pagan temples. Springing from these columns are arches of early construction, supporting the northern wall of the upper church. The columns seem to stand on a uniform plinth, running along the aisle, but in fact, it is a brick wall of the Imperial period." The remainder of this chapter is chiefly theological. In Chapter III., leaving the descriptions of the pictures, with the meditations thereon, we find the following most interesting narration:—"Under this" (the Tribune) "as well as under the southern aisle, several chambers have been discovered, and are supposed to be some of the original chambers of Clement's house. Only three of them have been as yet partially explored. When the excavations reached the west end of the north aisle, it was found that this ancient basilica stands on the ruins of much earlier structures. Observing that the lower part of the west wall was built of

* See p. 683, *ante*.

a quality of brick far superior to that above it, the ground was dug to a depth of 14 ft. and three walls of three different constructions as well as of three different periods were discovered. One is of the finest brickwork of the Imperial times, and probably belonged to Clement's palace. It forms, as it were, the chord of the apse. Parallel with it, leaving a space of only 2 ft. 1 in. is another wall of *tufo lithoide*, which is very probably part of the walls of Servius Tullius, the sixth king of Rome. Upon this is built another, of the Republican period, of colossal blocks of travertine, varying in length from 8 ft. to 10 ft. These walls have been traced 98 ft. from north to south; from east to west the travertine wall was traced 410 ft., and the *tufo* wall upwards of 500 ft., without finding its termination either way. A depth of about 20 ft. is still buried in the earth, which shows how low the level of Rome of the kings must have been. A thorough exploration of the length and depth of these walls could not fail to throw great light on the topography of this quarter of Rome. Ascending from the intermural passage, just described, to the west end of the south aisle, and turning to the right we find a spacious staircase of twenty steps, constructed for easy access to the rooms of a fine Roman dwelling-house. Its walls are of Imperial brickwork, and the style of the stucco decorations on the vault induces us to assign them to the age of St. Clement. This chamber is precisely under the tribune of the basilica. In fact, it occupies almost the same position under the high altar as the Confession of St. Peter does in the Vatican basilica, so that there can be little doubt but that it is the *memoria* mentioned by St. Jerome in his notice of St. Clement written towards the end of the fourth century." A few pages further on we read, "Just beyond the apse of the basilica, the side wall of the *memoria* showed three arches filled up with excellent brickwork, and embedded in it two pilasters of Parian marble. These pilasters have debased Corinthian capitals contrasting strongly with the Classical style of the stucco vault. The roughly-chiselled foliage reminds one of the arch of Gallienus: it shows declining art, and was not executed till the beginning of the third century. Breaking through the brickwork, we found a long narrow passage, 28 ft. by 6 ft. 10 in. A few inches beyond the pilasters is a fragment of a large column of Numidian marble sunk into the pavement. Opposite to this was a doorway, also bricked up. On breaking through it a large hall was discovered 30 ft. long, 20 ft. wide, and almost entirely filled with earth. The first impression was that this was the real oratory, the vestibule answering to the *ambulacrum* intersecting the well-known basilica in the Catacombs of St. Agnese, and, as in that basilica, the smaller chamber under the apse constituting the part reserved for the altar. The circumstance also that there had been a door at the extreme end strengthened the idea. The vault was pierced by eleven *luminaria*, or skylights, some round, some square, and all decorated with mosaics. Mosaic bands also run round the sides and at the ends. The simplicity of the decorations and the absence of Pagan forms, gave strength to the conviction that it was the first Christian oratory. Much of the ceiling, however, was made of small stones artificially imitating a grotto; and when the whole was cleared out, as we see it, there remained no doubt that it was one of those caverns in which Mithras, whose altar had been already found, was habitually worshipped. It was evident that it was not originally a Mithraic cave, but a large room changed and adapted to the Mithraic mysteries. At Ostia, the Emperor Commodus gave up the palace crypt to the priests of Mithras. The like had been done here. Along the walls were raised platforms ascended by three steps. They have been found in other Mithræums, but here there is a peculiarity: they are not level, but form an inclined plane toward the walls. They are 6 ft. wide and 3 ft. 3 in. from the ground. It is difficult to say for what purpose they served. They may have been occupied by the initiated in the mysteries; or, as De Rossi thinks, they were *triclinia* on which the guests reclined while participating in some sacred feast held in this cave, which is by no means improbable; for in the Mithraic mysteries there was a profane imitation of the Sacrament of the blessed Eucharist. Along the outward extremity of these benches there is a depressed edge on which are five semicircular niches, two on the right hand and three on the left. They were formerly covered with marble, fragments of which still remain. In the Mithræum discovered a few years ago at Ostia, there is a similar edge, on which were placed lamps, fire-vases, and small altars of terra-cotta. The five semicular niches probably contained the figures or statues called *signa sacrorum*, symbolising the five grades of initiation into the Mythraic mysteries, to which we shall hereafter refer. High up in the wall, at the end of this temple, is a niche, which formerly must have contained a statue of Mithras, and lower down is a small square cavity, built of brick. It might have contained water for religious purification, or perhaps served as a receptacle for the blood of victims. Near it, on the floor, there still remains a portion of an altar, and a few inches in front a small round piece of marble, upon which, it is supposed, burned the sacred fire that was kindled and preserved in the two small square furnaces, facing each other, in the sides of the benches. The learned Cavaliere Visconti thinks that the round piece of marble we are just after noticing served as a pedestal for the conical-shaped stone that was found here, representing the birth of Mithras; 'for,' as Layard and others write, 'owing to the comparison between him and his symbol, fire, it was said that he had been generated from a stone, from the fact that a spark is produced by striking two flints together. Mithras, therefore, was called Θεος εκ πετρος, and hence the stone itself was called his mother. This statue is 25 in. high. The deity, from his knees upwards, has emerged from the stone. He stands erect, and wears the Phrygian cap. The arms from the elbow are wanting. It was broken into three pieces, which were found at various periods during the progress of the excavations, and is the only one of the kind in Italy.

Near the pilasters already alluded to, was discovered the ara or altar, now placed on the floor in the centre of the Mithræum. The upper part of it, on which probably was represented the chariots of the rising and setting sun, and the symbols of the seven constellations, is quite gone. It is of Parian marble, and, in its mutilated state, is 4 ft. high, 2 ft. 5 in. across the front and back, and 20 in. along the side. On the front of it is the background of a grotto, in the centre of which is the *taurobolium* or sacrifice of the bull. Mithras is clad in a short tunic with his clamys fluttering over his left shoulder. He wears the Phrygian cap, and is looking earnestly towards the heavens. He has his left knee on the bull stretched on the ground before him, and while he holds him by the nostrils with his left hand, he plunges a dagger into his shoulder with his right. A dog and serpent lick the blood that flows trickling from the wound, and a scorpion gnaws the scrotum. The tail of the bull ends with ears of corn. Two genii, clothed like Mithras, stand as his assistants, one with his torch erect to indicate the rising sun, and the other with his torch depressed to indicate his setting. On the edges of the upper part of the grotto, to the right and left are fragmentary figures of the sun and moon, and within it is a raven. Low down, on the right of the spectator, is the head of a lion, which, so far as we know, has not been, as yet, found on any other monument representing the *taurobolium*."

The following twenty pages are given to a most learned exposition of Mithraic worship, from which it appears that this religion, which was in its essence a deification of nature, was first introduced into Italy by the fleet of Pompey, when it returned to Ostia in 687 A.U.C., after having finally defeated the pirates of Cilicia; but that it was not well known until the second century A.D. The system was derived from the Persians who worship the sun under the title of Zor-Aster, and they on their part derived it from the Chaldean Magi. Mithras, whose symbol was fire, and who was supreme in the movable planets, was a mediator between man and Hormisdas,—the benignant deity,—and his principal work was to offer an expiatory sacrifice for the human race. The Romans confounded Mithras with the sun, as we learn from the inscriptions on the altars and marbles dedicated to him, in which he is invariably called,—"Deus sol invictus Mithra—Soli invicto Mithræ." In the reign of Adrian, the worship of the sun was substituted for that of all the gods; but it was from the end of the third to the middle of the fourth century that it obtained its greatest number of adherents, and was practised alike by Pagans and Neoplatonists, who endeavoured to demonstrate that it had been the primitive religion of mankind. Strange were its mysteries. If we turn back some fifty pages we read that in 394,—"In the temples of Alexandria, the crue mysteries of Mithras were discovered, and in the secret *adyta* the heads of many children which had been cut off, mangled, and superstitiously painted." They seem, too, to have practised a species of vivisection, though not for scientific purposes, and to have immolated human beings that they might inspect their bowels for the purposes of divination.

Contrary to our intention, we will quote the description of one fresco, as it shows, in the clearest manner that even in those primitve times the superintendence of a building was *literally* enough to make a saint swear. "In the lowest compartment there are four figures, one of which is in the attitude of giving instructions to the others, who are engaged in dragging a column, and each has his name written near him. . . . . Three are clad in the short tunic which is the badge of servitude. Sicinius wears the toga, and is addressing the men in the following terms:—'Get behind the column, Carvoncelle, with a lever. Albertel, draw it up. Whoresons, draw it up.' This compartment may, perhaps, have some allusion to the building of the Church of S. Clemente."

The following brings us to the end of this section:—"Inserted in the wall of the narthex are several inscriptions, and fragments of inscriptions, some of which are pagan, and others Christian; also exquisitely sculptured capitals, divers pieces of broken columns, fragments of marble candlesticks, ornamental sculpture, pieces of mosaic pavement, and tiles with the names of the makers and the consuls in office at the time."

The next section is entitled "Modern Basilica of S. Clemente," and opens with ten pages of preliminary remarks, which we entirely omit as without the scope of the work, and unnecessarily galling to the *acattolici*. We then arrive at the description of the church, which is illustrated by an interior and a section. An inscription over the door informs us, in eighteen lines, that it was restored in 1715. "We must regret that the restorations are not in keeping with the style of the church; and in particular, that the heavy carved, gilt, flat ceiling, substituted for the open timber roof, existing 1690, presses upon and conceals some parts of the mosaic apse. The stucco-ornaments, and the pictures above the arches of the nave, are also of the last century. A series of frescoes is painted over the colonnades that divide the nave and aisles."

Further on we read,—"Outside the chapel (of the Rosary) to the left, is the monument of Cardinal Venerio, of Recanati, who died in 1479. The columns sculptured with vine-tendrils, and birds pecking at the grapes are very beautiful. The capitals are admirable specimens of fine pierced work. On the rim of one of them is engraved the name 'Mercurius Presb. S. Clementis,' very probably the same John Mercurius, titular of the basilica, who erected an altar in it under the Popedom of S. Hormisdas, 514-523, and therefore they must have been removed from the underground basilica." . . . . Having described the modern portions of the church, we will proceed to examine it as carrying out the primitive arrangements of a Christian basilica, reproduced from the original beneath. First, the front, once painted, is roughly built with four antique columns, sustaining a Gothic canopy, three of the columns being of granite and one of *cipollino*, differing in order and diameter, two having Corinthian and two Ionic capitals; the door-jambs are rudely sculptured with tracings of dissimilar designs. There are also remains of other buildings, and the whole is carelessly constructed. . . . . From this outer porch we enter the quadriportico, which is oblong, being 62 ft. by 50 ft., and surrounded on three sides by sixteen pillars: twelve of grey Bigio marble, three of Numidian marble, and one of Oriental granite. The pavement of the atrium contains many fragments of green and white serpentine, and in the centre of the court is the impluvium to receive the rain. So far we have the usual arrangement of the Roman palace. The fountain at which the Christians purified themselves before entering the house of God was restored in 1868. In the porticoes of the ancient palaces, family busts and other ornaments were found. In those of the church were placed pictures." Again: "As we passed through the quadriportico to the great door of the church, persons excommunicated and utterly cast forth from prayer at the time, weepers, and mourners in sackcloth and ashes,—winterers as abiding the elements,—would lament their exclusion and beg for prayers. The vestibule of

the modern church being precisely over the ancient one, the first step into it would bring us among the catechumens and penitential hearers, both of whom were obliged to withdraw before the offertory. They were under the rod of the *ostiarius*, and hence this place got its name *Narthex*, which signifies a rod.

The interior of the church before us is 170 ft. 6 in. long, by 70 ft. 9 in. in width. On either hand sixteen antique columns separate the nave from the aisles; five of them are Parian marble, and of these four are fluted and one plain; five others of Numidian marble, three of granitello, two of Oriental granite, and one of *bigio*. The pavement is of beautiful *Opus Alexandrinum*, in varied patterns. More than one-third of the nave is occupied by the choir, with its paschal candlestick and elevated ambones on either side. At its further end is the shrine of the martyr, to whom the church is dedicated, with the altar over it, raised in front of the bishop's throne, and the sedilia for the priests. The sight is arrested, at this most important point of a Christian basilica, by the ciborium over the altar, and the rich mosaics of the apse. . . . . The high altar is separated by marble panels from the laity, the penitents, and the catechumens. . . . . Before we approach that elevated spot, which, in all the ancient basilicas, is nearly the same,—a platform from wall to wall, mounted by steps on either side of the altar,—let us examine the choir, on a lower level, but raised also by one step above the floor of the church. It is paved with rich Alexandrine work; the entrance-gates are enriched with mosaics; the great marble panels are carved with wreaths and crosses, and one conspicuous monogram frequently repeated; and on the jambs supporting them are engraved the fish, the dove, and the branches of the vine." This monogram, the author sees reason to suppose, is that of Pope John II., 532—534; and the panels upon which it is found to be of the sixth rather than of the ninth century.

On either side of the choir are the *ambones*. The word *ambo* is said to be derived from the Greek word *αναβαινειν*, to go up, which might apply to any other staircase, so that it is possible that *ambones* may be a colloquial corruption of *umbones*, that is convex projections, or elevated promontories. . . . . The Gospel *ambo* has a double staircase, on one side toward the altar and on the other toward the narthex. According to an old Roman ordo, the two acolytes with their candles separated when they reached the *ambo*, two sub-deacons with thuribles, and the deacon with the Gospel, passing between them; and going up into the *ambo* by one staircase, the sub-deacons immediately descended by the other, and there stood. A third sub-deacon, preceding the deacon, held in his left hand the Gospel to be opened at the mark, and the deacon read on a higher step in the *ambo*, which a sub-deacon was not to mount. . . . . As we stand below the altar before the slab of the martyr Consul Clement, on either hand are two white marble *transennæ*, admirably worked, and they were once, probably, in their proper place in the lower basilica. These network panels sufficed to admit air to the lamps within, and did not hide the martyr's body from the sight of the worshipper. In the more ancient *transennæ* the interstices were larger, that cloths might be passed through them to touch the body; for the corporeal relics were not then generally distributed. On either side of the shrine, steps lead to the platform upon which the altar stands; and to know the use of the altar we must turn to the episcopal chair behind it, raised by three steps above the sedilia, for the priests, diverging from it on both sides. . . . . The bishop then was most appropriately placed in that seat, where the prætor had decided so many profane causes, for between him and the people is no longer the table upon which the death-warrant of Christians had been signed, but the altar upon which the Lamb of God, who taketh away the sins of the world, is immolated. . . . . The altar in St. Clemente's is at the west end."

Our task is now ended. If, in reducing 450 pages to a few columns, the soul of the book has escaped through those great wounds which the process of excision has produced, we need not apologise to those to whom the *anatomy* of the subject is alone of vital importance.

St. Pancras Vestry-hall.—This building, of which we gave a view a few weeks ago, has been formally opened for business.

REPORT OF THE PRIVY COUNCIL ON EDUCATION.

This report states that "the two most urgent requirements of the country, viz., the provision of a suitable number of suitable schools, and the supply of a body of teachers qualified to conduct these schools efficiently, continue to be rapidly met. Voluntary effort, which in past years has done so much for national education, has seldom been found wanting, but, whenever it has failed to keep pace with the demands of a growing population, the enforced local organisation which by the Act of 1870 is kept in reserve to take its place, has been called into action." As a proof of the importance of voluntary efforts, we find that in the last ten years the sum of 4,238,099*l.* (to meet Government grants of 5,958,976*l.*) has been subscribed towards the maintenance of elementary schools under inspection; and the annual amount derived from this source has risen from 277,760*l.* in 1864 to 616,326*l.* in 1874. The number of subscribers in these ten years was respectively 145,856 and 251,185. Voluntary effort in the past year further contributed 172,166*l.* towards the erection of those elementary schools to which building grants were made, and 22,395*l.* towards the maintenance of training colleges under inspection.

The average attendance in aided schools has risen from 1,225,764 in 1870, to 1,727,449 in 1875, and the total number of names of scholars on the registers of the 12,167 "inspected" schools was 2,497,602, of whom 2,070,727 were actually present on the day of the inspection.

Up to the 31st August, 1874, the number of School Board schools in England and Wales was 838, affording accommodation for 245,508 children; and up to the 30th September the number of School Boards was 859; and excluding London, the sum paid to the Boards, out of the rates in the year 1874, amounted to 267,907*l.*; the sum raised for the School Board for London, was 105,951*l.*—being equivalent to a rate of 1¼d. per pound on the rateable value of the district. The average rate per pound on the rateable value of the other School Board districts was, in English boroughs 2·13d., and in English parishes 3·22d.; in Welsh boroughs 2·58d., and in Welsh parishes 3·01d. In no less than forty districts the rate amounted to 9d., and over, per pound, and the highest rates in England were reached in the parishes of Queenborough and Staplehurst, Kent, with 1s. 4d. per pound each, and in the borough of Chesterfield with 10d. In Wales the highest rates were in the parish of Melindur, Glamorgan, with 1s. 3d., and the borough of Llanidloes with 6¼d.

The School Boards have availed themselves freely of the power of borrowing on the security of the rates and loans amounting to no less than 4,179,174*l.* have been recommended to be granted to 502 School Boards, by means of which new accommodation will be furnished for some 370,956 scholars.

Besides the sums received for the rates, the sum of 1,490,938*l.* was actually paid to the treasurer of Board Schools during the year in respect of loans; 574,693*l.* of this were advanced to the London School Board.

The total expenditure of the School Boards in 1874 was 1,825,957*l.*, of which 1,397,857*l.* were spent in the purchase of sites and the erection of buildings. The average cost of completed schools, including furniture and fittings, was 11,635*l.*; the average cost per child accommodated, 11*l.* 19*s.* 11*d.*

THE SANITARY CONDITION OF BATTERSEA AND NEW WANDSWORTH.

An outbreak of scarlet fever of a serious nature, in Battersea, has led to grave charges being made respecting the sanitary arrangements and condition of the locality, against the Wandsworth local authorities, in whose district it is situated. The charges refer more specifically to the unsatisfactory condition of the sewers as regards ventilation. Mr. Thomas Buckham, C.E., who resides in Spencer-road, New Wandsworth, has just addressed the Home Secretary on the subject, in which he says:—"The ventilation of the sewers has evidently been neglected, and no apparent precautions were taken to prevent the approach or spread of this fearful malady. I do not know whether or not you have any jurisdiction over the 'Board of Works for the Wandsworth District,' in which body I presume is placed the responsibility of carrying out the Acts of Parliament imposed upon them in the year 1856 and subsequently. But if you can by any means ask them to empower their medical officer, surveyor, and sanitary inspectors with some discretion to adopt temporary means to alleviate the present calamity, you will command the united thanks of the whole neighbourhood." Writing to the surveyor of the Wandsworth District Board himself, Mr. Buckham states that in the whole vicinity of New Wandsworth, with the exception of the two main roads, the sewers are totally without ventilation, and that the ventilators of the other portions of the parish have never been charged with any deodorants for now nearly two years, the effect of which is that the residents of the district are constantly inhaling disease. He adds:—"As you are aware we are situated at a level of upwards of 60 ft. above the southern low-level sewer, the consequence being that at high water in the Thames, in muggy and stormy weather, we get a rapid discharge through the traps and water-closets of the houses, impregnating the cisterns and the dwellings with the nauseous and fatal gases emanating from a system of sewerage nearly the whole way to Deptford. It appears to me there is a laxity of duty somewhere, and I think the sooner your Board give instructions for some remedial measures, the better will they be respected."

PORTSMOUTH DOCKYARD EXTENSION.

It is understood that her Majesty the Queen is about to open the new works at Portsmouth, a view of which we now present. Very remarkable works they are. When they were begun in 1866, the area was mere mudland, which was left uncovered at every tide. The outer enclosure or rampart against the sea, consists of an internal and an external wall, with the space between them filled in with a core of clay. Owing to alluvial deposits, great difficulty was experienced in finding a solid substratum for these walls. The area of the dockyard is 115 acres; the area of extension, 178 acres; total 293 acres. The walls of the basins are exceptionally strong, the lower part being composed of concrete, lined with brickwork, and the upper part with Portland stone, bound or "coped" with granite.

The walls of the docks are of Portland stone and granite. The locks will have a depth of 27 ft. 6 in. over their inverts at low water spring tides, and will thus be able, at all states of the tide, to transfer a first-class ironclad from the tidal to the repairing basin, or *vice versâ*. The locks and docks have greater fulness of section than older docks, to meet the altered form of our modern ships. The entrances to all of them are 80 ft. wide. The depth of the basins and docks is 50 ft.

In construction, railways, ninety-four steam engines, steam cranes, steam hoists, &c., were used, and from 700 to 800 convicts have been continually employed. Bricks, the average production of which has been about 20,000,000 a year, have been made by the convicts.

The caissons of the docks, between the tidal and the repairing basins, are not floated into position, but are slid into and out of chambers in the walls.

The estimated cost for the completion of the undertaking was 2,207,000*l.*

The work is being carried out by Mr. Henry Wood, the Admiralty superintending civil engineer at Portsmouth, assisted by Mr. Macdonald.

Our illustration shows:—

A. Steam basin opened by the Queen on the 25th of May, 1848.
B. Tidal basin, open to the harbour, and subject to the same fluctuations in the height of the water in it as the harbour.
C. Repairing basin, having an area of 1,369 ft. by 700 ft.
D. Fitting basin.
E. Rigging basin.
F. Caissons.
G. Docks.
H. Locks, to be used also as docks.
K. Shears; one having a lifting power of 130 tons.
L. Reserved for the erection of a coal depôt.

In the background are seen Porchester Castle, Portsdown Hill, and forts.

The Llansaintfraid Chapel.—At a meeting of the building committee of the Bethesda Chapel, it was decided to accept Mr. Richard Edwards's tender for the alterations and renovation required for the chapel, according to plans prepared by Mr. Lay, of Welshpool.

THE ORDNANCE SURVEY.

Surveys of England and Wales on three different systems are now in course of completion by the Ordnance Department, viz., on 1-in., 6-in., and 25-in. scales. Scotland is also being mapped out on the three scales, while the surveys of Ireland on the 6-in. and 1-in scales are being revised. On the completion of the survey of Ireland on the scale of 6 in. to a mile, the survey of England and Scotland, which had been previously proceeding on the scale of 1 in. to a mile, was resumed, but the survey of Ireland on the 6-in. scale having proved to be of immense importance for the valuation of that country, a similar scale was adopted, and Yorkshire and Lancashire in England, Wigtonshire, Kirkcudbrightshire, Edinburghshire, Haddingtonshire, Fifeshire, and Kinrosshire, and the Isle of Lewis, in Scotland, were surveyed on that scale. But it was found that the absence of townlands in Great Britain, the areas of which were engraved on the plans of Ireland, rendered the 6-in. scale plans of far less value in Great Britain than in Ireland, and it was ultimately decided that the scale of $\frac{1}{2500}$, or 1 in. to an acre, should be adopted for all the cultivated country in Great Britain, and the 6-in. scale for the uncultivated parts. This 25-in. scale will enable the areas of any property to be easily obtained from the maps.

On December 31st the maps of the following counties in England, on the 25-in. and 6-in. scale, had been surveyed and drawn,—Northumberland, Durham, Cumberland, Westmoreland, Yorkshire, Lancashire, Cheshire, Flint, Denbigh, Essex, Middlesex, Kent, Sussex, Surrey, and Hampshire, and the Isle of Wight and the Isle of Man; while portions of Pembroke, Cornwall, Stafford, Warwick, Herts, and Oxford had been completed. The new survey on the 1-in. scale is completed, down to a straight line drawn from Preston to Hull, and the south-eastern counties are completed, with the exception of the drawing in of the hills.

Of Scotland, nearly the whole of the mainland has been mapped out on the 25-in. and 6-in. scale, and the new 1-in. survey has been proceeded northwards as far as a line drawn from Oban to Peterhead, the maps for the whole of the country south of this line being engraved in full, and a large portion of the remainder being engraved in outline, and with names only.

The revision of the 8-in. maps of Ireland is finished in so far as relates to Ulster, and the counties of Kildare, Carlow, Dublin, and Westmeath. The 1-inch map of Ireland needs only the hills to be filled in in the following counties:—Fermanagh, Cavan, Galway, Clare, Tipperary, Kilkenny, Carlow, Wexford, Waterford, Cork, Limerick, and Kerry.

The total areas surveyed are as follows:—In England and Wales, of a total area of 58,000 square miles, 26,358 have been surveyed on the 6-in. and 25-in. scale. In Scotland, out of an area of 30,000 square miles, 28,858 square miles have been surveyed, and the maps published.

Besides this, 819 sheets of a special map of London, on a scale of 5 ft. to the inch, have been published, and special maps of other towns, on a 10-ft. scale, are being engraved. But it would be tedious to enumerate the various works which the Department has in hand, for they are too numerous to specify, and many of them are not of sufficiently general importance. It is satisfactory to be able to add that the progress of the work in which the public has the greatest interest, viz., the mapping out of our country on a systematic plan, is progressing surely, if not as quickly as would be desirable; and that the special calls of the War Department for maps for military purposes do not seem to interfere much with the progress of the work.

A GREAT HOTEL FOR GLASGOW.

After some litigation operations have commenced for the erection of what is intended to be one of the finest hotels in the country, to be situate at Charing-cross, in the West End of Glasgow. The site at Crescent-place, Sauchiehall-street, and lying between Woodside-crescent and St. George's-road, was acquired by Mr. John Duncanson, builder, with the object indicated some little time since, but the work has been retarded by the legal opposition of parties who conjectured that by the partial demolition of the fashionable houses now standing there, and building on the roadway in front of the crescent, the rights of the public would be interfered with, and the amenities of the neighbourhood destroyed. Mr. Duncanson, however, having obtained from the Lord Ordinary, in the Court of Session, a declaration of his absolute right to the ground, the work of erection will proceed without further delay. To Mr. James Thomson, of the firm of Messrs. Baird & Thomson, architects, Glasgow, has been assigned the task of preparing the plans. Preferring not to rely solely on his own individual taste and experience, and knowing the determination of Mr. Duncanson to make the structure an exceedingly handsome one, the architect gladly availed himself of the suggestion of the proprietor to accompany him on a visit to London, to inspect some of the hotels there, with a view to adopt and embody such points of beauty or utility as might suggest themselves. Mr. Thomson also, subsequently, inspected some of the hotels of Paris with the same object. It is intended that the new hotel shall have an elegant elevation in Sauchiehall-street, with a large public entrance in the centre of the building. There will be spacious shops on either side the front entrance, 16 ft. 7 in. in height, and ranging in frontage from 40 ft. to about 15 ft., the front of the hotel being carried on iron fluted columns. The existing houses at Crescent-place, a portion of which will be merged in the hotel buildings, are now being partially transformed, so as to provide bedroom and other accommodation. To a height nearly corresponding with these houses, the new erection will be carried round the other three sides of the square, leaving a sort of court inside which is to be built up to the height of the first story, and lighted from the roof with glass, the remaining space, up to the height of the surrounding buildings, being left as a "well-hole," or ventilation space. The dimensions of the dining-hall will be 71 ft. long and 39 ft. in breadth, with 30 ft. height of ceiling, and these will be from 130 to 150 bedrooms, with ample parlour, smoking-room, and other accommodation to be found in first-class premises of the same kind. Absurdly enough, the establishment will be named the "Charing-cross Hotel," and the total cost will be between 80,000*l.* and 90,000*l.*, including the sum of 20,000*l.* paid for the site.

AN AMERICAN VIEW OF CHURCH ARCHITECTURE, AND CHURCH SCHOOLS.

In the days of the Apostles Christians gathered for worship in private houses or in public rooms hired, or donated to them. When terrible persecutions raged, they met in more sequestered places. In the earliest centuries, followers of Christ were to be found in Syria, in Egypt, in Africa, and in Asia. About the year 244, the Emperor Philip, the Arabian, favoured the Christians, and gave them permission to build churches. In one or more of these lands ruins of the most ancient churches in the world are to be found. More interesting discoveries may yet be made by students of these ruins. It is supposed that many of the earliest churches resembled Jewish synagogues. With the exception of some very ancient ruins, comparatively little is known of the architecture of the churches of the first century.

About the fourth century, the Roman emperor, Constantine, espoused the cause of the Christians. By him and his successors many churches were built. In those days there were many heathen temples throughout the Roman empire; there were also buildings called Basilicas. The Basilica was often, if not always, grander even than the temples used for idolatrous purposes. The Basilica might be called a palace in which justice was administered, and a part of which merchants could use as an exchange. When new churches were erected, some were built on the plans of the heathen temples—some on the plan of the Basilicas. To-day, the visitor in Rome can find a few churches, said to have been originally heathen temples, or can look upon quite a large number of churches that so resemble the Basilicas that they have been called Basilican churches. These great buildings—their walls heavier than those of many an ancient fortress—in whose pillared interior the words of a speaker sound strange and hollow, under whose chancels rest the ashes of the dead,—these buildings, which one can fancy exceed in grandeur many of the heathen temples of olden times, have in their turn been looked upon as models for new churches for ages.

The architects of these buildings seem rather to have understood the copying of the wrecks of heathen splendour than they did the fine requirements of a building suited for Christian worship; indeed, these buildings were better suited to impress an awe-struck worshipper of the divinities of pagan Rome than they were for places of Christian worship.

Although, during the ages, certain styles of architecture were introduced, the interior proportion of the churches seem copied from the first Roman churches.

After the dark ages, many of the Roman Catholic churches and cathedrals passed into the hands of Protestants. Although three centuries have passed since the Reformation, it is sad to see how little improvement has been made in the architecture of the churches of evangelical Christians. To be sure, such men as the gifted Spurgeon, of London, and Talmage, of Brooklyn, have made important improvements in the architecture of their churches, yet many Protestant places of worship may almost be called miniature copies of the great cathedrals of olden times.

A new feature in church architecture, introduced within a century, is the Sunday school-room.

The history of Sunday-school architecture can be summed up in few words. During the last ninety-three years it has been customary with many congregations to fit up the cellars or lecture-rooms of their churches for Sunday-school purposes. During this period commendable efforts have been made by earnest Christian men and women to found schools in places especially convenient for children. These earnest workers, realising in some measure the advantage of having good attractive buildings for the children, have erected some of the finest Sunday-school buildings in America. In the architecture of such schools there has been displayed much taste and ingenuity. The architects of these schools have not been under the thraldom of traditional rules as have been the architects of so many churches. Many congregations, stimulated in part perhaps by the example of the earnest men and women who have been so successful in founding what have been called mission schools, have built quite handsome—sometimes very handsome—additions to their churches for Sunday-school purposes.

In these days, when a new church or Sunday-school room is to be built, generally a building committee is appointed by a congregation. Upon this committee devolves the selecting of a design for the new building. An architect is employed. The architect submits a design, the greatest merit of which often is, that it appears churchly, looks like some old cathedral. The gentlemen on the committee may be men of taste and education. If any of them were about building a country villa, he would have many suggestions to make to the architect,—he would perhaps aim at rivalling in beauty of variety and architectural perfection, the baronial halls of England or some of the scarcely less beautiful country homes in the suburbs of the cities of America. Yet these gentlemen adopt a design for a church with scarcely a dissent. When the design is presented to the members of the church, although they are expected to approve or condemn or amend the design, it would seem that they generally, with few words, accept the selection of their committee.

Within the last few years, a new style of church architecture has made its appearance in America. Although the style is new in America, there were churches built centuries ago on a very similar plan. I allude to the tabernacle Mr. Talmage has reared in Brooklyn. It is doubtful whether Mr. Talmage, with all his devotion and earnestness of appeal, has been enabled to do as much for the cause of Christ as he has accomplished by introducing this style of architecture. The style of the Brooklyn Tabernacle, which is semicircular, has been copied by Mr. Hepworth, of New York, who preaches to one of the largest congregations in America; and by scores of other churches.

The congregation of the Rev. Stephen H. Tyng, jun., of New York, has also been enabled to contribute to the improvement of church architecture, by erecting a church on a somewhat new style. The arrangement of his pulpit is specially worthy of notice.

In this age a minister is expected to be an agreeable speaker. Although a minister looks to a higher source than simple oratory to affect the hearts of his listeners, yet it would seem as though it was more difficult for him to speak well in some churches than in others. An orator longs, for his own sake as well as for the sake of others, to have all the advantages which the

architect can give him. He prefers to have the people ranged in a somewhat circular position around him, or at all events to have them ranged in such a way that when he speaks he will not feel as though he was addressing an army drawn up as few abreast as though in marching order. He desires to stand in a position in which he can give and receive sympathy,—in which he can see and be seen by every one whom he addresses. He does not desire to have any of his audience hidden behind pillars. Could a Demosthenes, or Cicero, or Quintillian come to this earth again, and have occasion to speak in some modern churches from enclosures called pulpits, he might well shrink, if he cared for his fame, from doing so, feeling that he was called upon to undertake a cruel task. A faithful minister of Christ, however, has a message of such importance to dying men that he is thankful to be enabled to speak to his fellow mortals in any church in which his voice can be heard.

The architecture of Sunday-school rooms is as yet in its infancy. It should receive especial attention. It, perhaps, can be truly said that the style of every Sunday-school building erected at this time will be copied not only in this land, but also in those lands in which the Sunday-school system is being introduced, and will be transmitted to future ages.

Mr. John Wanamaker, of Philadelphia, who has been so intimately connected with the founding of the school so widely known as Bethany Mission—now as Bethany Church—one of the largest schools in America, has shown a commendable interest in Sunday-school architecture Mr. Wanamaker having offered premiums for the best designs for Sunday-schools, some twelve designs were submitted from architects in different parts of the country. In the *Sunday-school Times* of August 1st, 1874, can be seen the drawings of the design to which was awarded the highest premium.

A church or Sunday-schoolroom should be broad and spacious, cheerful and well ventilated; a building well lighted by day and which can be handsomely lighted up by evening.

Every modern improvement which will add to the convenience and comfort of even the youngest member of the congregation, should be remembered.

Especial care should be taken to have the building heated by the best means. Some furnaces are injurious to health. Probably Sunday schoolrooms, and prayer-rooms, in the country, would be heated most advantageously by simply burning wood in an open fireplace.

To rear a good church in a neighbourhood in which it is needed, is a work which Christian men and women should covet. Long after the designer shall have passed away the building may stand a monument to their noble toil.

One main object of this essay is to draw attention to the fact that the architecture of many churches and schools might be greatly improved at comparatively little cost.

It would be startling, indeed, if it were known how badly many churches and Sunday-schools are ventilated. Can it be possible that those who meet in these buildings are ignorant of the great importance of breathing pure air? Must their attention be called to the fact that bad ventilation is said to be a more potent cause of disease than any other? Must the long, terrible, ghastly list of diseases which follow in its train be again enumerated? Shall they be reminded of the depression,—of the petulance and discomfort which they have so often experienced? Perhaps one of the best ways to get an idea of the importance of good ventilation is to study the history of hospitals. Such a history, however, is too terrible to dwell on! I draw attention the more freely to this fault, so common in church architecture, as it can be so easily remedied,—often at such slight expense. In every church or school, or infant class-room, in which there is even a suspicion of the ventilation being bad, a competent architect should be employed to give, after due consideration, a careful opinion as to what improvement in architecture is needed. Let it never be forgotten, however, that no matter what skill the architect may display, good ventilation will not be secured unless sextons are better supervised than they often are. How many sextons are there who know enough to air a church or schoolroom before and after its being used?

It is to be regretted that the sunlight is not oftener admitted into churches and schoolrooms. From every assembly of people certain poisonous gases are given forth. The gases, to a greater or less extent, settle in the furniture, &c. The rays of the sun are said to be an excellent disinfectant. There are churches whose gloomy, though perhaps imposing interiors, have not for centuries been brightened with a flood of cheerful light. The custom of having stained glass in the windows is to be deprecated,—a custom that has descended from a superstitious age.

Some churches have lights so placed about the minister that the congregation cannot look at him without having their eyes dazzled; other churches are so poorly lighted that the congregation can scarcely read a hymn. The manner of arranging the lights in a church, especially about the pulpit, should receive very tasteful and skilful attention.

The position and style of the pulpit in many a church could be greatly improved.

There are some churches and schools of such faulty architecture that no architect can alter them to his satisfaction.

In future, let Christians blessed with architectural talents lay at the feet of Jesus the choicest treasures of their genius, then a more independent, a more suitable style of church architecture will prevail than has ever graced the earth before.

New York. John C. Henderson, Jun.

PROPOSED FUSION OF THE INSTITUTE AND ASSOCIATION.

Sir,—The end, "Senior," last week assigned to my suggestions seems so untenable upon the facts put forth, and which he has in no way altered, that I really must apologise for asking space to reply. Had he definitely given the grounds upon which he based his conclusions, we might have seen the precise line that separates our opinions, but, as it is, I do not think he has at all confuted the possibility of a scheme such as I proposed, being attended with good effect.

From the tone of his letter, I should imagine he considers it impolitic that the Institute should do more than the "next to nothing" it now does, and, therefore, no alteration is necessary. I start with the contrary as an acknowledged fact, and wish to discuss merely the means by which it may be improved. If, therefore, he considers the present position of the Royal Institute of British Architects satisfactory, and one that it ought to occupy, I, of course, have no ground of debate with him; but if he agrees with me in thinking change desirable, I would ask in what he considers it defective, and how he would propose to remedy? We could then put our ideas side by side, and perhaps, by incorporation, produce what is really required. My object is simply to obtain a governing society occupying to the architectural profession, the position which the Law Institution does to the Legal, believing it would tend much to the improvement of our art and the public mind upon it.

In few words, "Senior's" letter amounts to about this:—

1. The Institute will be annihilated *because* the Fellows will then be subject to some little control from other members.

2. Students will have the opportunity of learning more, though paying less; *therefore* the scheme is all wrong.

For my own part, I cannot see how these conclusions come logically out of the arguments. I had hoped the reasons I gave for each suggested alteration were so plainly set forth that misapprehension could not well arise.

"Senior" seems to have overlooked the fact that I was merely taking two societies with aims in common but different ways, and by endeavouring to combine the acknowledged best points (and shall I say—prejudices?) of each to suggest a course by which they should become one, and so in future work in harmony and with mutual confidence. He also seems to have forgotten that my scheme is only the suggestions of one mind, open to amendment in all points. It is well known that for rules to be complete, for no matter what purpose, they should be the result of the experience of many minds and many views: it was to obtain these views I asked you to publish my ideas and this reply; and if not intruding too much on your kindness, I should wish to answer somewhat in detail the issues "Senior" raises.

He asserts that the new society must necessarily be of much lower character than the present. My wish is quite the contrary. In extending the term "Associates," I said "*gentlemen* willing to concur, &c.," and I have yet to learn in what manner, no matter what profession (or even *trade* if you will) they follow, they are inferior to architects. The mode of election I suggested is, if anything, more exclusive than the present, and as it rests with the members themselves, I do not see why we need anticipate its being abused any more than we do now. No one will, I think, venture to affirm that the status or prestige of the Inst. C.E. is below that of the R.I.B.A.; yet in its charter the qualification of an Associate is given in very nearly the terms I suggested, except of course the application to architecture instead of engineering.

I fail also to see how my suggestion as to hon. members will lower the Institute in that particular. My idea is that the honour should be as great to the Society as to the individual, whom, be it remembered, the Fellows only have the power to elect.

Notwithstanding this, however, "Senior" will, I hope, give me credit for wishing to raise the standard for Fellows by making it a necessary qualification that they shall have attained a considerable degree of eminence in their profession, which rule I would have carried out as strictly as in Great George-street, where the form of proposal recommends a person because he is or has done so-and-so, &c.; at the R.I.B.A. it is simply because he has the slight qualification required and wishes to join. This one trait I think fully illustrates the manner of the two Societies.

I drew particular attention to the unusual composition which I suggested for the council, and gave my reasons. "Senior" opposes, but gives none except the meagre note that only four out of ten would be Fellows. He forgets that the *ex officio* members would in all probability also be Fellows. The Associates and Students, as being the far larger, though "junior" classes, are fairly entitled to be represented, especially when it is remembered that the former is really the type of the "average architect." The mode has worked well in the Architectural Association. The introduction of the hon. member to the Council would, I believe, leaven the discussions with just so much of the lay element as is necessary in the consideration of all professional questions.

As I have before said, my remarks are suggestions only; and if on the whole four was thought too small a proportion to be Fellows it could readily be increased, though for my own part I can see no reason for assuming, as "Senior" does, that the Associates would necessarily combine with the Students in preference to siding with the Fellows. From an intimate knowledge of both classes, I should say rather the reverse. In the proportions I gave the Fellows would most decidedly be most powerful, for in conjunction with either of the other classes they are the stronger; and if opposed to all the rest, should they not give way, though even here the *ex-officio* might support them? My wish, however, would be that no such *class* questions should disturb their deliberations. Let us hope the time is at hand when such petty feelings may be confined to the "vestries and vestryism," whence they mostly originate.

As to the subscription, "Senior's" remarks are not only intemperate but beyond the question; the one I quoted is that which has been that of the Architectural Association for some considerable number of years, and without any ill effect. As to my remark with regard to the examination fees, it is evident some further inducement is necessary to cause present students of the Institute to submit to it; what I suggested was simply means to an *end*. If "Senior" likes them not, pray put forth other, or perhaps he likes not "the end."

In conclusion, may I further suggest that if this correspondence is to answer any practical good, it will be best attained by its being carried on with an unimpassioned calmness.

R. E. P.

Sir,—It appears to me that "R. E. P." would, by his scheme of amalgamation, produce a society much inferior to the Institute, and possessing less activity than the Association; but I think "A Senior," in your last issue, when writing of "quantity measurers" as amongst the miscellaneous members to be introduced in the new scheme, threw a slight upon one branch of the profession. It is the fashion with certain architects to look down on those who take out quantities as belonging to an inferior branch of the profession, or rather an inferior profession altogether. Why should this be?—for, leaving the provinces out of the question, it is a fact that

a large number of those who take out quantities in the metropolis are properly qualified architects, who have, through a mere chance, gradually taken up the more scientific branch of the profession of an architect and surveyor. Some of the gentlemen now engaged on quantities have been students of the Institute and Royal Academy, several have passed the voluntary examination, and one was a Pugin Travelling Student. Many London quantity surveyors have been estimating clerks to contractors, and their general knowledge of building matters is often much superior to that of the ordinary architect.

In the provinces the quantity surveyor is almost unknown; all call themselves architects, whether they are qualified professional men, or ex-builders' foremen, or auctioneers.

QUANTITY SURVEYOR.

CASES UNDER THE METROPOLITAN BUILDING ACT.

Enclosures of Buildings.—On Tuesday, the 20th ult., Mr. Sedgwicke, of 211, Hackney-road, appeared before Mr. Bushby, at the Worship-street Police-court, on a summons by the district surveyor of Shoreditch, for constructing an irregular building.

From the statement of the district surveyor, it appeared that defendant had constructed a wooden enclosure and roof to an external staircase leading from defendant's house to a detached building in the rear. The fact was admitted; but defendant stated that, after receiving a formal notice from the district surveyor, he had removed the wooden roof, and he considered that what remained of the structure could not be considered a building under the Act. The district surveyor pointed out that, although by the first schedule every building must be enclosed with *walls*, it was not provided that there must necessarily be a roof, though section 19 provided for the *external covering* of roofs; he, therefore, contended that it was not essential that there should be a roof in order to constitute the structure a building within the meaning of the Act; there was no definition of a building in the Act. The learned magistrate said it appeared to him that one of the principal objects of the Act in question was protection against fire. He thought the risk from fire to defendant's structure was almost equally great whether the structure was covered with a roof or not, and that the Act was intended to prevent the erection of such a structure. He would, however, adjourn the case for a month to enable defendant to make an application to the Metropolitan Board of Works, if he thought proper, to ask their sanction for some modification of the structure instead of the enclosing walls which the district surveyor had required to be built.

Alteration or Repair.—Mr. M'Cann attended on a summons by the same district surveyor, for refusing to pay a fee of 15s. for an alteration to a shop-front at No. 28, Pitfield-street.

The district surveyor stated that defendant had executed the work without giving due notice. When first discovered, the whole of the old shop-front had been removed, and afterwards a new front was put in in a different form. The fee claimed was a reduction on the amount that might be charged. Defendant contended that the work was a necessary repair, not involving any structural alteration, and therefore exempt. He stated that the old shop-window consisted of two squares of glass, one of which had been broken, and that he had only taken out and repaired the sash, and made it for one square of glass instead of two. The defendant afterwards gave evidence on oath as to the case. In cross-examination by the district surveyor, he admitted that the entrance in the old shop-front was in the centre, whereas that in the new one was at the side. Upon this evidence the magistrate decided that the work was an alteration within the meaning of the Act, and ordered payment of the fee claimed, with the costs of the summons.

Cornices of Shop Fronts.—Mr. J. Randall, builder, of Victoria-road, was called on three summonses, by the same district surveyor, for irregular construction of the shop-fronts to three houses in Bath-street.

The defendant did not appear, and on proof having been given that the summonses had been duly served, the case was heard in his absence. The district surveyor stated that, according to sec. 26 of the Act, the cornices of shop-fronts, as well as other projections, "must be so arranged and constructed and so supplied with gutters and pipes as to prevent the water therefrom from dropping upon or running over any public way." This the defendant had neglected to do. He had been served with notice to amend the work in each case, but had failed to do so. These facts having been duly proved, the magistrate made orders for the work to be done in fourteen days, with the costs of the summons in each case.

Additions to Large Buildings.—At Worship-street, Mr. William Scott, builder, of Antill-road, Mile End, was summoned for erecting a new building, and uniting it to an old building, the cubical contents of which then exceeded the maximum allowed by the Metropolitan Buildings Act, 18 & 19 Vic., cap. 122.

Mr. Philbrick, barrister, instructed by Messrs. Loxley & Morley, of Cheapside, appeared on behalf of Messrs. Charrington, to defend. The complainant was Mr. Legg, district surveyor of Mile End. Messrs. Charrington, it appeared, had recently had an addition made to their brewery in Brick-lane, Spitalfields, and the district surveyor claimed that the new building could not be united to the old without a party-wall being run up between the two, the Act of Parliament limiting the contents of a building to 216,000 cubic feet without party-walls. The Act was passed in 1855, and Messrs. Charrington's buildings were erected prior to that time. The Act was not retrospective, and the brewery, though admittedly exceeding the maximum allowed by the statute, was not interfered with. Mr. Philbrick argued that the Act did not contemplate the erection and addition of a new building which did not exceed in itself the statutory limitation, and the contents of that building alone not being in excess the summons must fail, as the Act had already legalised the old building. It was said that if a party wall was to be erected it would cause a loss of several thousands of pounds sterling to Messrs. Charrington, as it would divide their largest premises and compel them to remove a valuable erection called a "mashtub."

Mr. Bushby gave a lengthy judgment, in which he said that the 9th section of the Act enacted that an addition to an old building should, "to the extent of such addition," be subject to the regulations of the Act. The point was whether the limitation implied by the words "to the extent of such addition," meant that the old building was to be ignored in deciding what was necessary to render the addition conformable to the Act, or whether the limitation only meant that the old building need not be interfered with further than was necessary to make the new conformable to the Act. He thought the last was the most reasonable view, and made an order for the erection of the party wall, but was willing to grant a special case.

HOW THE DEPARTMENT OF ART CAN BE BEST UTILISED.

SIR,—It is exceedingly strange that, after so many years' experience in the working of this Department, outsiders should still be found insisting on that policy which has always proved abortive, viz., that the Department should be made a Technical School of Design. "Schools of Design," was the very title with which the Department was ushered into existence, but which was afterwards abandoned when the policy which was indicated by that title proved to be a false one.

A central art institution, directly interfering with and influencing technical developments of art, is an inversion of the ancient modes of proceeding; and when fine and technical art reached their highest, the old-world method of developing the fine arts was to encourage them in their highest aims, in order to raise the taste of the people, and by these means indirectly influence and improve all the subordinate arts of design.

The manufacturers should themselves look after their special artists and designers, take pupils into their designing offices and there educate them to their requirements, to the technical conditions to be fulfilled, taking care to collect all foreign novelties in the shape of patterns, &c. A central Department will never be able to supply designers for the manufactures with any marked success. As soon as you detach the special artist from the factory and the presence of the special manufacture, he will indulge in caprice, and wander from those practical limits which it is so essentially necessary to preserve.

A passage in an article in the *Builder* of the 24th ult. fully substantiates the correctness of this view: "But few of the students who are trained wholly in our schools ever succeed in making a means of livelihood as designers of patterns: while those students who spend the day in a factory and the evening in an art-school generally succeed in making a living of some sort."

What then should be the function of the Art Department? Why this—the development of monumental, of historical, art. As a Government department, it could most effectually render assistance to that regal art, which Sir Charles Eastlake and the Royal Commission on the Fine Arts, years since, declared was "beyond the reach of private patronage."* The department devoted to such a purpose would have a *grand raison d'être*. It would not interfere with the Royal Academy, which encourages that kind of art which is the offspring of private patronage. South Kensington by adopting such a policy would take the head and front in art education, and exercise a more potent and beneficial influence over the subordinate arts of design than by any other means.

W. CAVE THOMAS.

Property in St. James's-square.—Winchester House, No. 19, St. James's-square, was bought in last week at 42,000*l.*, the reserved price not being reached.

* "Mural Decoration has for a century and a half received little or no encouragement in England. Bare walls are the rule in our great public buildings, and in our churches. The object now is to find opportunities fit for the development and display of historical painting on a large scale, for this is precisely the class of painting which, more than others, requires encouragement beyond the means of private patronage. The want of such encouragement has long been regretted, not by professors only, but by all who have turned their attention to the state of painting in England,—a proof that the promotion of historic art is an object of interest with a considerable portion of the public."—*Report, Royal Commission on the Fine Arts.*

HYDE PARK AND KNIGHTSBRIDGE BARRACKS.

THE vast and rapid extension of London which now encircles the park and Kensington Gardens adds to the value of these beautiful woodlands, in proportion to the yearly increase of population—the crowds frequenting the walks and glades, with thousands of carriages thronging the drives, in quadruple ranges, show how the public appreciate the taste and skill displayed in border plantations, shrubberies, and flower-walks.

Both the ride and the drive are continuous round the park; but the drive, which is now changed to the interval between Hyde Park Corner and Albert Gate, has of late been often blocked by the increasing stream of carriages in double lines both going and returning. The taste displayed in shrubbery and floral decoration is most conspicuous in perhaps the worst portions of the border, as, for instance, at the back of the paltry shops and houses of Knightsbridge, and up to the barracks; but here for the extent of about 300 yards there is no ornature (on one side) save the unsightly old building, the officers' quarters, stables, and mess-rooms, with sentinels dismounted—in fact, four ranges of windows, the bedrooms of troopers, overlook and command the fashionable drive—added to this, the street frontage on the south side obtrudes upon and narrows the Kensington main road, which is the principal western thoroughfare. Except as regards the officers' quarters, which command an unrivalled park view, these barracks are decaying, old, and inadequate: the rooms being but 8 ft. to 9 ft. high, whilst there is no inclosure for drill or muster; and their position is such a bane upon the choicest quarter of the town that all *neutral people* agree as to the expediency of moving them. Many, however, clinging to a fixity of tenure, object that "they must be near the park and palace," and therefore cannot be transferred to Chelsea. Now it so happens that there is a site upon which a modern and suitable barrack might be erected, at very little distance, and that is upon a spacious and open plot of ground adjacent to the palace entrance at Kensington, upon a part whereof now stands the old and disused barrack, covering a space of 220 ft. by 80 ft., between the Palace-road and Palace Garden Terrace, and to which may be added any portion of the open green, adequate to the erection of proper barracks; together with a reserve ground for drill and muster.

All this could be effected without encroachment upon the palace view, or upon any private property; and as the old palace is in a tottering state, and must shortly be rebuilt or removed to a higher position on the palace reserve of the gardens, the sooner the work is begun the better.

A portion of the palace grounds eastward stands 10 ft. higher upon the plateau, commanding a view of the round pond, and of Repton's plantation vistas; here is a site worthy of a palace, situate 400 ft. within the west boundary, and close to the central traverse roadway, without trespassing 1 ft. upon the public gardens. The new Guards' barracks stand also near to it, with entrances from Church-street and from Palace Garden-terrace.

The old palace was built in line with the garden's boundary wall, of which it seemed to form a part; the new palace, as recommended, would be interned in the grounds, with scope sufficient for any erection to suit Royalty, and even adequate to the reception of levees and drawing-rooms, as well as for an abode worthy the dignity of the empire.

It was suggested by a correspondent in the *Builder* to transfer the Guards' barracks to the centre of the park, near the ranger's lodge, where a sergeant's guard was formerly quartered to protect the magazine; here, although "far in wild and unknown to public view," where *several private pensioners' rural abodes have been erected*, the regiment might certainly be located, by clearance of the old guardhouse, new villa, cottages, and stables; but if the Horse Guard regiment were thus interned, adieu to the sequestration and user by the public of their once valued and beautiful park.

The position I have recommended stands clear of all interference with the palace, the gardens, or private property; in fact, the space of 18 to 20 acres, external to palace and gardens, has been for years an open waste! A more modern small guardhouse and five old cottages, occupy the northern and upper extremity, together with an inclosed pasture-field of about 8 acres, extend-

ing to Bayswater-road, all of which are in strict keeping with the condition of the old palace, and all are external to the gardens' boundaries. If Knightsbridge is a suitable position on account of its propinquity, this site is still more eligible; it would meet military requirements most thoroughly, and could not interfere with public rights.

QUONDAM.

THE FRENCH ARTISTS' ASSOCIATION.

The twenty-ninth annual meeting of the Association of Painters, Sculptors, Architects, Engravers and Designers was lately held in the Great Hall of the École des Beaux Arts, Paris, under the presidency of Baron Taylor, the founder of the Association.

According to the *European Review*, on the opening of the proceedings by M. Louis David, an architect, read a report on the works of the committee of the Association during the year 1874 to 1875. He showed that on the 31st of December, 1873, the society numbered 3,892 members; the following year these had increased to 4,109; and at the present moment they numbered 4,500. The funds have, of course, risen in proportion. In 1873 the receipts were 83,818f.,—this year they had reached the sum of 158,418f. The expenses having only amounted to 80,209f., there is a surplus of 77,358f., which has been converted into 4,000f. Rentes; thus, with this addition, the income of the Association has now reached a total of 44,000f. M. Louis David concluded this interesting report by announcing that a fine-art sale would be held in the spring of 1876 to increase the Pension Fund of the Society, and called on all its members to assist in the successful realisation of this project. He then continued, amidst the applause of all the artists present, to eulogise the constant and devoted services rendered by Baron Taylor to the Association.

Baron Taylor thereupon rose to thank the assembly. With visible emotion he glorified French art, and declared that it gave him the greatest satisfaction to consecrate to art and artists what little strength he still retained. He has well earned the praise that was given.

THE RIGHT OF OWNERS TO SUPPORT FROM ADJACENT LAND.

LOWE AND ANOTHER *v.* TROTTER AND OTHERS.

This was an action, tried at Stafford, to recover damages for injury done to the houses of the plaintiffs by mining operations of the defendant under adjacent lands.

The property of the plaintiffs consisted of a public-house and premises adjoining the Brettal-lane railway station. The surface of the district has been long undermined, and old cracks in the house showed that the land on which it was had suffered from the effects of subsidence at a period prior to any workings of the defendants. The question, therefore, came to be whether some more recent cracks and damage now complained of were attributable to the acts of the defendants.

His lordship (Grove) carefully laid down the law with reference to the right of owners to support for their land from the adjacent land of their neighbours, and asked whether, assuming old workings existed, the defendants' acts had caused the damage for which the action was brought.

The jury found in favour of the plaintiffs, damages, 80*l.*

A question was also put to them whether, if the land had been in a solid state and unaffected by former mining, the operations of the defendants would have injured the plaintiffs' house. The jury found a difficulty in deciding this, and his lordship discharged them from doing so, saying that, in his opinion, the plaintiffs, although their house stood on "honeycombed" land, had a right to the adjacent support for the land, such as it was.

A GRANITE LIGHTHOUSE FOR CEYLON.

A lighthouse has been built by Messrs. Shearer, Smith, & Co., for the Little Basses Rock, Ceylon, and is about to be transported there for erection. The tower, which is wholly formed of Dalbeattie granite, is constructed after designs by Mr. J. N. Douglass, engineer to the Trinity Board, its height measuring 101 ft. 8 in., its diameter at base 33 ft. 3 in., at top 22 ft. In plan it is circular throughout, and the courses of masonry are sixty-four in number. In profile it diminishes by an elliptical curve from 33 ft. 3 in. at base to 17 ft. at a point 67 ft. 6 in. high—the first fourteen courses, which are of solid masonry, forming a series of steps. From this point it is carried up vertically for 18 ft., when a projecting cornice is formed. Above the cornice, where the seventh floor is formed, the diameter is reduced to 16 ft. 6 in., thence again carried up vertically for 7 ft., when a heavy moulded cornice is formed which completes the profile. Its interior arrangement is a series of seven cylindrical rooms, each measuring 13 ft. in diameter, by 9 ft. 6 in. in height. The floors are formed entirely of granite, so fitted together as to be self-supporting, and forming at once a level floor for one room and a domed ceiling for the one immediately underneath. In the living-room are fitted a neat set of granite jambs with moulded mantel-shelf, whilst under the first door is a place set apart for a water-tank. The entrance-door is situated at a height of 33 ft., whilst at a height of 89 ft. a second door is placed where the first cornice forms a projecting ledge, nearly 3 ft. in width. The tower is also provided with sixteen windows, into the openings of which, as also to the doors, gun-metal frames are fitted. The Trinity Board have had Mr. J. R. Seldon as resident superintendent during the progress of the work, and, the tower being put together in sections, each section was personally inspected by Mr. Douglass previously to its removal. The blocks have been cut according to full-size templates, drawn out by Mr. James Oswald, foreman at the works, and the stones, when finished, put in their respective places under his direction,—the building being thus wholly fitted together before removal to its destination.

ST. JAMES'S CHURCH, BRIGHTON.

The new building is up and nearly finished. It is in the Early English style of architecture, slightly decorated at the chancel arches, window, and reredos. The total length of the building, north to south, is 89 ft., outside measurement, and total width, east to west, 66 ft., outside measure; while the width of the nave is 24 ft.; height to springing of roof, 39 ft.; the roof rising above this about 23 ft. The width of the aisles internally is,—west, 17 ft. 10 in.; and east 14 ft. The church consists of a nave, two side aisles, and a chancel, the nave being lighted by a clear-story, having twenty-four single pointed-headed windows, and two double ditto, and three long lancet windows in the south end, with a circular window over, light being also obtained from the north by a large chancel window with tracery head. The walls of the clearstory on each side and the nave roof, are supported by three pointed arches of moulded brickwork, springing from piers of beaded kiln bricks, and Bath stone in courses, the corners being moulded, and the bases and caps of Bath stone moulded. The arches on each side of the chancel in continuous line with the nave are in Bath stone moulded, and having a "dog-tooth" worked therein. The materials of construction are,—for outside walls, flint work with kiln brick piers, lacing courses, eaves, and label moulds, with Bath stone window and door dressings, and Bath stone mullions. The roof over the nave is of open-timber work, with moulded and chamfered tie beams and ribs. The seating arrangements accommodate between 700 and 800 persons.

Messrs. E. E. Scott & Hyde are the architects, Messrs. Patching & Webber the contractors, and Mr. W. H. Webber, jun., is the clerk of works.

THE METROPOLITAN RAILWAY COMPANY AND THE MOORFIELDS CHAPEL.

HEAVY EXPENDITURE.

According to the statement made by Sir Edward Watkin, chairman of the Metropolitan Railway Company, at the half-yearly meeting of the Company held on Friday last week, it appears that the Company have had to incur an exceptionally large expenditure in connexion with the Roman Catholic Chapel in Moorfields. In constructing the works of the Bishopsgate extension just opened, they had to pass immediately in front of the chapel, at a considerable depth below the street level, and under the Act of Parliament they were bound to maintain the structure exactly as it stood, not being permitted to pull it down. It was found, during the progress of the works, that the chapel was constructed upon piles, which in course of time became less substantial, and he said it further appeared that the architect of the chapel had put upon the building a tremendously heavy roof, making it top-heavy. The consequence was that the contractors had to underpin the whole of the chapel, to the depth of 30 ft. in the London clay, before they could construct an inch of the railway passing the chapel. The result of this underpinning was that the walls in some places cracked, and two or three valuable fresco pictures were damaged, which the company were responsible for, and he might say that the company had had to build a brand new chapel. They had paid to the Rev. Dr. Gilbert for the restoration of the interior of the chapel 4,000*l.* The cost of the underpinning amounted to 8,000*l.*, and the expense of providing for the congregation in the interim a temporary church stood at 1,023*l.* They had also paid to the arbitrator 540*l.*, together with 104*l.* to the solicitor, and had yet to meet the architect's claim for 900*l.*, the entire cost amounting to 14,500*l.*! He added that the necessary works in respect of Finsbury Chapel amounted to 1,000*l.*

PROPOSED RE-NAMING OF BISHOPSGATE STREET.

A movement has been started for doing away with the "Within" and "Without" as regards the well-known old street in the City, and at a Bishopsgate Ward Vestry-meeting which has just been held, a motion was made that Bishopsgate-street should be so-called throughout its entire length, instead of "Within" and "Without." It was urged in favour of the proposed change that on several grounds it has become absolutely necessary. It was urged that great and serious loss is caused by letters and parcels being delivered at wrong houses in consequence of double numbers, and also that the loss of time of persons traversing the streets to discover whether the person he requires is "Within" or "Without" is a great evil, and a source of annoyance, and involves pecuniary damage. It was objected against the proposal that there would be re-numbering, re-painting, and re-printing invoices and other forms, which would be vexatious to tradesmen; but this was met by the answer that the inhabitants of some 1,800 other streets in the Metropolis have had to bear this inconvenience in their turn. To the objection that the street would lose its historical and traditional character by the change, it was answered that such could not well be the result so long as the name "Bishopsgate-street" was retained. The proposal was, however, defeated, but it is stated that it will shortly be again brought forward, and be supported by petitions in its favour by several of the inhabitants in the street.

ENGLISH AT THE MANSION HOUSE.

Sir,—My Lord Mayor Stone has made a good bid for fame, and has done a good work; but he wants some cleverer people about him. As a visitor from abroad I went to the Reception at the Mansion House on Saturday last, after a visit to the Alexandra Palace in the afternoon, and must confess I was horror-struck by the man who announced the carriages in the hall:—"The Mayor of Tureen" (poor Italy!) "A Bishop whose name is unknown." So much for fame—who wants to be a bishop? "Mr. Hexeter, Mayor"; and so on, and worse. As to the Alexandra Palace, I did not get much pleasure from my visit. There was a vast crowd, and I and my party got out into the air as much as possible. A few piercing screams reached us now and then, which, I am told, was the concert. I pitied my poor *préfet*.

I am much pleased with the Lord Mayor for the snub he has obviously tried to give Germany in all these doings.*

A Frenchman who Knows English.

DIVERSION OF SEWAGE FROM THE THAMES.

The Thames Conservators, in their report, dated the 5th inst., just issued, observe:—

"On reviewing the results of the notices served on various persons and places requiring the diversion of sewage or other offensive or injurious matter from flowing into the river, the Conservators are enabled to report that above the intakes of the water companies only four towns still pass their sewage into the river; of these, two,—Oxford and Reading,—have sewage works in a forward state, and of the other two, Windsor has commenced the sewage works, and Abingdon is about to do the same. A hope may therefore be entertained that above the source of the chief water-supply of the metropolis all sewage will very soon be diverted from the river. Between the intakes of the water companies and the western limits of the metropolis, where the main drainage scheme comes into operation, a less satisfactory state of matters prevails. Notwithstanding the measures taken by the Conservators under their Acts of Parliament, the local authorities, with the exception of Twickenham, have not yet diverted their sewage from the river. The Conservators will not relax their efforts to enforce a compliance with the provisions of the Conservancy Acts until the diversion of the sewage and the consequent purification of the river above the limits of the metropolis have been fully accomplished."

* We hold a quite different opinion on the subject.—Ed.

STONE CHURCH, KENT.

The ruins of Stone Church, near Faversham, have been visited by some members of the Archæological Institute. Mr. J. H. Parker, remarking upon the unique masonry of the walls of the chancel, said that he believed the chief portion of it was Romano-British, of about the fifth century. The east end was an addition, probably of the Early English period. The alternate courses of hewn stone and Roman bricks were very remarkable in the original work, the extent of which is indicated by the foundation of a cross wall at its east end. This wall was taken down, when the later eastern portion was added to the chancel, and its base was formed into a step; some of its materials were used in making two other steps up to the new altar. At the west end, Mr. Irvine pointed out the original entrance to the chancel by two steps, descending from the nave. In the lower step he found the round hollow in which a chancel door or gate swung upon a pivot. Mr. Parker remarked that the Romans used that method of hanging doors. Sir John McLean and Canon Scott-Robertson, made some observations respecting traces of early English painting upon the plaster inside the walls.

BRICKS.

At a meeting held at the Hop and Malt Exchange, of various brickmakers supplying the London market, it was computed that there were lost to the building trade through the late floodings of the fields and in diminished moulding, about one-eighth of the season's make, or over one hundred millions of bricks, and a rise in price was consequently threatened.

OPENING OF THE CRESCENT HALL, WALTON-ON-THE-NAZE.

Mr. Robert Warner, of Broomfield, Chelmsford, and the head of the firm of John Warner & Sons, of the Crescent, Cripplegate, London, is a landowner at Walton. Some short time since Mr. Warner established a new foundry and engineering works at Walton, which are now assuming considerable importance, and employing a good number of workpeople. Numerous dwellings accordingly are being erected near, which are beginning to make a new suburb. Mr. Warner, having a desire to afford means for the mutual recreation and improvement of his workpeople, decided to erect a club-room and hall for their use. On the 23rd ult. this building, designed by Mr. T. A. Cressy, of Walton, was opened. The building and surroundings were gaily decorated, and a number of the workmen, headed by the Walton amateur brass band, and carrying banners and flags, made a circuit of the town, and marched to the hall, where a good tea was provided. After tea an entertainment was given in the lecture-room. Mr. Goslin, the manager, from London, in the course of the evening, delivered an address, in which he laid before the members the details of the origin of the movement, and the objects for which the hall had been built, and the Club and Mutual Improvement Society established. At the close of the entertainment many expressions of gratitude were accorded to Mr. Warner for his munificence. The Club is instituted especially for the workmen employed at Messrs. R. Warner & Co.'s Engineering Works, although any one resident in Walton is eligible for membership.

CHURCH OF ST. MARY ALDERMARY.

The church of St. Mary Aldermary, in Queen Victoria-street, is about to undergo extensive repairs and restorations; it is now the church of four united parishes,—St. Mary Aldermary, St. Thomas Apostle, St. Antholin, and St. John Baptist, the two latter parishes having recently become united for ecclesiastical purposes consequent upon the demolition of the church of St. Antholin. The sum proposed to be expended is 8,000*l*. The plans have been prepared by Messrs. Tress & Innes, and approved by the united vestry, and the works will shortly be commenced.

The edifice immediately preceding the present one was founded in the year 1510. It was destroyed by the Great Fire of London, and rebuilt by Sir Christopher Wren upon the plan of the former church.

FENTON TOWN HALL COMPETITION.

In public competition for the new town-hall, police station, engine-house, &c., Fenton, Staffordshire, the urban sanitary authority have awarded the premium to the design submitted by Mr. J. William Stevens, of Wingmore-road, Camberwell, under the motto "Labore vinces."

WHITWORTH SCHOLARSHIPS.

The following is a list of candidates successful in the competition for the Whitworth Scholarships, 1875:—

Joseph Harrison (aged 21), mechanical engineer, Hyde; George Goodwin (20), mechanical engineer, London; John Alldred (21), locomotive engine-fitter, Wolverton; Franklin Garside (20), pattern-maker, Oldham; Frank W. Dick (21), mechanical engineer, Glasgow; Joseph Poole (20), fitter and turner, Dudley.

WORKMEN'S WAGES.

Sir,—I beg to inform your correspondent, "J. Barnett," that the Court of Queen's Bench has recently held in two cases (Millett *v.* Coleman, 39 J. P., 454; and Shaw *v.* Alderson, 39 J. P., 374), that wages are recoverable in the police-courts under the Master and Servant Act. Before these decisions the answer given by the magistrate was a doubtful one. G. K.

INTERMENT OF THE DEAD.

Sir,—Allow a short letter to settle a long, grave controversy which will never be settled by the fishmongers' basket. The closed coffin, as at present constructed, being every way suitable to our method of interment, the objections to it afterwards are easily obviated by making the lid so that the moist earth should soon make openings by dissolving the glue, which secured a longitudinal insertion in it. Senex.

FRENCH ARCHÆOLOGICAL CONGRESS.

The Congress of the *Société Française d'Archéologie* will be held this year at Chalons-sur-Marne, commencing on Monday, the 23rd of August, and ending on the 28th. A list of thirty-four questions for discussion (seven of which relate to matters pre-historic) is published.

The Congress of the *Institut des Provinces* will be held at Autun early in September.

SCHOOL BOARD SCHOOLS.

Siddal (*Halifax*).—The school at Siddal, erected by the School Board at a cost of 4,600*l*., has been opened. Before the formation of the present board it was resolved to build a school in the neighbourhood of Siddal. The school is large and airy, is fitted up with every convenience, and divided into infant and mixed departments of about equal size. There are three class-rooms to each, and the desks are Moss's patent. It is calculated to accommodate 490, and the cost is about 4,600*l*. Messrs. Horsfall, Wardle, & Patchett, were the architects.

Lee Mount (*Halifax*).—The infant school here has been formally opened by Mr. Swallow, the chairman of the School Board. Some time ago an offer was made to the Board, by Mr. Joseph Binns, on behalf of the trustees of the Lee Mount Sunday school, that it should be let to the Board at a nominal sum, besides the further offer of the trustees to make it adequate for the requirements of the township, and to build an infant school. The other school has been worked by the Board for some time; but the infant school-room has only just been completed at a cost of about 600*l*., including the chapel-keeper's house adjoining, with accommodation for 140 infants.

BRICKS COUNTED IN OR OUT OF KILN.

In the Crewe County Court, William Bebbington, brick manufacturer, Amor-green, Stapeley, sued Enoch Elson, builder, the Hough, for 13*l*. 14s. 9d., as balance of account for bricks supplied. The plaintiff stated that in March or April, 1874, he made an oral contract with the defendant, at the corner of a street in Nantwich, to supply him with bricks at 12s. 6d. per 1,000. The bricks were to be counted into the kiln, otherwise he would charge considerably more—about 14s. per 1,000. Defendant was to find coals for the furnace. On several occasions he was short of coals, consequently some of the bricks were not quite so well burned as they might be.—The Judge: You are entitled to be paid for the amount you claim, if the contract was to count them into the kiln.—The witness said that he had sunk two wells for him, for which he charged him 3*l*. Defendant had paid 134*l*. 14s. 3d., leaving a balance of 13*l*. 14s. 9d. to be paid. He counted the bricks every week as they were made. He had asked the defendant several times for the account, and he raised no objection until he received the County Court summons.

The defendant deposed that the contract was made for 12s. 6d. for bricks good out of the kiln. There was no written contract, and plaintiff never said that he would require 1s. 6d. more if they were counted out of the kiln. Plaintiff had to make the bricks and burn them. He had a contract to build the Willaston schools, but the bricks from plaintiff's kilns were refused, and he had to pay 28s. for substitute bricks, while he sold some of the bricks complained of at 23s. per 1,000. The bricks were soft and badly made. 12s. 6d. was more than the average price for the good counting out of kiln bricks. He had about 5,000 of the bricks now, and 5,000 were lying broken. He had sustained a loss of about 50*l*. by the transaction.

The Judge said he was satisfied the contract was to count into the kiln. It was an undefended action. This was subject to a cross action regarding the burning of the bricks.

TO REMEDY DAMP WALLS AT THE SEA SIDE.

Strip off the old plaster, rake out the joints, clean off the dust, throw water on the wall with a brush, coat all over about ¼ in. thick with Portland cement five parts, sharp sand one part; make the surface rough, let it stand two or three days to harden, finish with ordinary mortar (well haired) made with fresh-water sand or fine ashes. If required to be finished immediately gauge with plaster of Paris. Cement should not be used for the finishing coat. W.

STAINED GLASS.

Soham.—A stained-glass memorial window has recently been placed in the east end of Soham Church, which is about 12 ft. by 20 ft., contains twenty different subjects from the closing scenes in the life of our Lord, viz.:—His Entry into the Holy City, His Weeping over Jerusalem, the Last Supper, the Betrayal, the Denial by Peter, Christ's Agony in the Garden, Bearing the Cross, the Crucifixion, the Descent from the Cross, the Burial, Sealing the Stone, the Resurrection, His Appearance in the Garden, &c. The work has been executed by Messrs. Clayton & Bell, London.

CHURCH BUILDING NEWS.

Kittisford (*near Wellington, Somerset*).—The parish church of St. Nicholas, Kittisford, has been recently re-opened, after various reparations. The decayed old lath-and-plaster flat ceilings to the nave, north transept, and south aisle have been replaced by panelled polygonal ceilings, covered with stained deal boarding. The internal walls have been cleaned and replastered. The whole building (except the chancel and chancel aisle) has been repaved and reseated with two open benches. The tower has been divided off from the nave by a low perforated, ornamental screen. The old oak arches and shafts, separating the nave and south aisle, have been cleaned of whitewash, repaired, and reset. The porch being much decayed was rebuilt to a new design, but all ancient stonework has been re-used, wherever in decent condition. The interesting old font has been slightly repaired and reset on a new platform, while the Jacobian oak pulpit has been divested of paint, and placed on a Ham-hill stone base. The roofs externally are covered with tiles from Pool, near Wellington. The total cost of the works has been about 550*l*. Messrs. W. J. Arde & Cottrell, of Ashbrittle, were the builders, and Mr. Edmund B. Ferrey was the architect.

Pilsdon.—The interior of the church at Pilsdon (Pilesdon Pen), having undergone restoration, was re-opened for Divine service on the 11th ult. The expenses of the work have been defrayed by the late Mrs. H. Syndercombe Bower, and her son, Mr. H. S. Bower, of Fontmell Parva, near Blandford, the lord of the manor and patron of the living.

Pitney (*Langport*).—The parish church at Pitney was re-opened on the 21st ult., after restoration costing 1,300*l*. The nave has been rebuilt on the original foundations, the old Ham stone windows and other dressings having been carefully preserved and re-used. The exterior walls are of pointed blue lias stone, laid in regular courses; the inside being of tooled white lias, also in course work. The roof, which is open, is of pitch pine, wrought and moulded, with bosses from the old roof at intersections of the moulded ribs. The covering is of dun-coloured plain tiles. The old pews have been removed, and open benches of pitch pine, varnished, erected in their stead. The windows are glazed in quarry lights,

with tinted borders. The chancel roof has been completed, the bosses being decorated with gilded edgings. Mr. Knowles, Bridgwater, was the architect, and Mr. Cox, Yeovil, the builder.

Awre (Gloucester).—By the generosity of Mr. Henry Crawshay, of Oaklands, the old parish church of Awre has been restored at a cost of some 2,000*l.* or 3,000*l.*, and has been re-opened by the Bishop. The church was erected in the early part of the thirteenth century, and consists of a nave and chancel, a north aisle, separated from the nave by an arcade of six fine arches, a good south porch, and a tower at the west end of the nave. The walls, roofs, and floors were all more or less dilapidated, and in some cases in a dangerous condition, especially the chancel, the whole of which had to be taken down and rebuilt. The walls of the church have been pulled down, and rebuilt where necessary; the roofs have been stripped, re-covered with Broseley tiles, and boarded; the floors have been entirely renewed, and laid on a bed of concrete; the windows have been re-glazed, and the whole church has been re-seated; the tower has been restored; a western gallery, which formerly blocked up the tower-arch and window, has been removed; the bells and framing have been put in repair; an area has been made all round the church, with drainage therefrom; and provision has been made for warming the church with Gurney's stoves. In restoring the church, care has been taken by Messrs. Waller & Son, the architects, to preserve every old feature, and to put every old stone as nearly as possible in its ancient place. The colouring in the quatrefoils and ribs in the roof is a copy of the old work; the chancel-screen has been replaced; and the remains of the approach to the rood-loft can still be seen against the north wall of the chancel. The east window is to be filled with painted glass, the gift of Mrs. Crawshay.

Sticklepath (Devon).—Sticklepath is about four miles from Okehampton. The unsuitable character of the little chapel there has induced some of the people in the parish to build a better structure. For some time past there has been no service held in the chapel, the mother church of which is at Stampford Courtenay, about four miles off. They pulled the old erection down, bought and razed to the ground the cottages that stood in front, and having a clear approach for building they proceeded to build, and the opening services have been held. The structure is small, plain, and (barring the seats) unvarnished. It is in the Early English style, and bears a resemblance to a new Board school. There is a bell at one end of the roof, and at the other end a cross. The edifice cost about 600*l.*, but is very diminutive, holding about 100 persons. There has been no expenditure on ornament. Messrs. Geen & Ash, of Okehampton, are the builders, and Mr. Hooper, of Hatherleigh, the architect.

Lassington (Gloucester).—The picturesquely-situated and ancient little church at Lassington, three miles from Gloucester, having been restored, has been re-opened for divine worship by the Bishop of the diocese. The church is dedicated to St. Oswald. Several months ago Messrs. Medland & Son, architects, made a survey of the church, with a view to its renovation; they found that it was necessary that the whole of the structure should be taken down and re-erected, with the exception of the tower, and its quaint roof. The restoration, or rebuilding, has therefore been carried out in accordance with these ideas. A new south porch, chancel-arch, and nave windows, have been built of Norman character; and small lancet windows have been put in the south side of the chancel, to correspond with the original windows at the east end and north side of the chancel, which have been replaced. New open timber roofs, stained and varnished, have been constructed throughout, and covered with old stone tiles. The floors of the aisles and passages have been laid with Godwin's tiles. The seating throughout, and the lectern, are of pitch pine, varnished only. A new font has been erected, on a stone base, in the south-west corner of the nave. Behind the altar a small reredos has been fixed, consisting of central gable, supported on polished alabaster columns, and enclosing the sacred monogram, surrounded with a wreath of thorn. This work, and also the font and the carvings throughout the church, have been executed by Messrs. Frith & Morris, sculptors. The chancel window and south window of the nave have been filled with stained glass, by Evans, of Smethwick. The works have been executed by Messrs. Wingate & Sons, under the superintendence of Messrs. Medland & Son. The churchyard has been levelled, footpaths have been formed round the church, and a new churchyard gate with steps, thereto has been constructed.

Builth.—The new church here has been consecrated and opened. It is constructed in the Early English style, on ground contingent to its predecessor, and consists of centre and side aisles, chancel, place for organ, and vestry. It will seat 450 persons (the old one providing for only 180). The length of the nave is 66 ft.; width, 25 ft. 2 in.; side aisle, 14 ft. 9 in. wide; height from nave floor to wall-plate, 24 ft., and to apex of roof, 46 ft.; chancel, 30 ft. 6 in. long, from west to east, 20 ft. 6 in. wide; the vestry and organ-place measure 20 ft. by 14 ft. 3 in. The outer walls are built of Llanelwedd stone, which is obtained in the neighbourhood, and all the dressings are Box stone. The interior is faced with Bath stone painted light red. The roof is open-timbered of pitch pine, plastered between rafters and finished of warm (vellum) tint; the principals rest on corbels exposed to view. The nave and aisles are divided by an arcade of four arches, supported by octagon pillars, the caps of which are left in block for carving. The tracery windows are plain glass. The chancel and vestry are divided by an arcade of double arches, supported by a slender column. The walks are paved with Broseley tiles of black and red, and the chancel with Godwin's tiles. The seats are painted deal. The contract was undertaken by Messrs. Stephens & Baston, of Bristol, Mr. J. Norton, of London, being the architect; Mr. H. Carr, Builth (formerly of Bristol), was the clerk of the works. The old building, about eighty-five years old, of the quaint "high period" type, is to be entirely pulled down to make way for an entrance.

Howle Hill.—The little church here recently opened has been erected at the sole cost of Miss Philips, of Walford, near Ross, and consists of nave, chancel, sacristy, and south porch, and will accommodate rather more than 100 sitters, the building being a simple specimen of Early English architecture, executed by Mr. William Griffiths, of The Lea, near Ross, builder, from the designs and under the superintendence of Messrs. Haddon, of Hereford and Malvern, architects, the outlay being about 1,300*l.*

Stretford.—Stretford parish church has been re-opened, after restoration. The church consists of a nave with north aisle, chancel with north aisle, vestry, and south porch; and was in a sad state of dilapidation. The ground around was much above the floor of the interior, which was whitewashed, and fitted with high-backed pews of the horse-box fashion, littered down with straw to keep out the damp. The building is a specimen of Early English type, the roof continuing from east to west in one span, with king-post principals rising immediately over the centre arcading, the timbers being of massive oak. The work of restoration has been to remove the lath and plaster ceilings, and to throw open this roof by cleaning and renovating the timbers, which are stained and varnished, and re-covering the exterior with Broseley tiles, surmounted with terra-cotta cresting. The south porch and campanile, or bell turret, over the west gable, of oak, have been renovated, and the latter covered with a shingled roof, and surmounted with the ancient vane. The whole of the stonework, so thickly coated with plaster and whitewash, has been laid bare and well pointed. It was found necessary during the progress of the work to take down and re-build the south wall, and this has been cautiously done by replacing the whole, stone for stone. The chancel is fitted with oak altar-rail and standards, and stalls of pitch pine. The gangways are laid with Godwin's encaustic tiles. The windows are re-glazed with the old glass, as far as it could be utilised. The works were executed by Mr. John Sandford, of Norton Canon, under the direction of Messrs. Haddon, of Hereford and Malvern, architects, the total expenditure being within 600*l.*

East Winch.—The parish church has been re-opened after restoration. It is in the Perpendicular style, and was probably built in 1460. The work was entrusted to Sir G. Gilbert Scott, architect. The chancel has been thoroughly restored by Mr. E. Kent, the impropriator of the tithes; and a new reredos, painted by Mr. W. Munton, Lynn, erected. The length of the interior of the church, now that the seats have been removed out of the tower, is 104 ft. It formerly seated about 300 persons; it will now accommodate nearly 400. The total cost of the work will be about 1,500*l.* The work has been carried out by Messrs. Burdell, Brothers, of Middleton, under the direction of Mr. King, chief clerk in the office of Sir G. G. Scott.

Books Received.

Street's Indian and Colonial Mercantile Directory. Cornhill, 1875-6.

A new issue of the "Indian and Colonial Mercantile Directory" has been published, and will be found valuable. The various steam routes to the places treated of, with rates of fares, and times of transit, are given; particulars of the various railways in operation or construction are also supplied, and of the principal products, and the articles in which the trade of each place chiefly consists, so as to guide merchants with regard to shipments. The lists of the various traders, which give the merchant full particulars of possible buyers abroad, populations, extent of countries, and official information, appear to have been carefully revised.

Handbook of House Property. By E. L. Tarbuck, Architect. London: Lockwood & Co., 1875.

This is intended to serve as a popular guide to the purchase, mortgage, and compulsory sale of houses and land, and treats also of dilapidations and valuations generally. Mr. Tarbuck has divided his little book into three parts,—the First, relating to the law affecting land and houses; the Second, to the practice in valuations; and the Third, to procedure in building houses. He has brought together and condensed a large amount of floating information, and has produced a manual which will be found a very useful introduction to the study of the subjects treated of. We are glad to be able to recommend it.

Miscellanea.

Meersbrook Bowling-green, Sheffield.—Last year a number of gentlemen resident at Heeley, impressed with the desirableness of providing local facilities for the healthful outdoor exercise of bowling, formed a committee for giving effect to the scheme, and Mr. H. Matthews, architect, prepared the plans. It was ascertained that upwards of 2,000*l.* would be required, and the inaugural opening of the club has recently taken place. The premises stand upon a pleasantly-situated plot of freehold land, the main entrance to which is from Victoria-road. The green itself is 66 yards by 40 in extent, and it is intended to add to its attractions a shrubbery. The block of buildings comprise, in addition to a committee-room, residence for the steward, bar, &c., a spacious saloon, 31 ft. by 21 ft. and 16 ft. high; a billiard-room, 32 ft. by 26 ft., and 20 ft. high, supplied with lavatory and other requisites. The buildings have been so arranged that the billiard-room and the saloon may be thrown into one, so that a large apartment may be at the disposal of the committee for parties and concerts. The work has been carried out, under the superintendence of Mr. Matthews, by the following contractors:—Masons' and joiners' work, Mr. Wilkinson; plasterers' work, Messrs. Barter, Unwin, & Son; painters' work, Mr. G. E. Bennett, Fargate; plumbing and gasfitting, Mr. J. F. Tayler, Norfolk-street; slaters, Messrs. Staniforth & Lee. The tiles have been supplied by Mr. H. Webb, of Worcester; and the green itself has been prepared and laid by Mr. W. Markham.

Destructive Fire at Hereford.—The extensive timber-yard of Mr. Bower, Bath-street, Hereford, has been almost completely destroyed by fire, which broke out on the 28th ult. about one o'clock. The stock and permanent plant and the workmen's tools it was found impossible to save, partly from the rapidity with which the flames spread, and partly owing to the inadequacy of the fire-engines to cope with the fire. These premises were about the most complete of the kind in the country, and the loss is estimated at about 10,000*l.*, exclusive of the workmen's tools, one set of which, belonging to the foreman, valued at 70*l.*, have been lost. It is conjectured that the fire originated near the boiler; that some shavings and chips which may have been strewed alongside by the planing machine were ignited by a spark from the fire-hole. Some timber afterwards caught fire, and the building after this was speedily enveloped in flames.

The Grosvenor Club for Workmen.—The concert and lecture hall, which has been in course of erection during the last twelve months, in connexion with the Grosvenor Club for Workmen, in Buckingham Palace-road, has been opened. This club was designed upon the model of a West End club, to supply workmen at an expense within their means with the comfort and advantages of club life, and after an existence of nearly three years the object of its promoters may be said to have been so far accomplished. Its chief merit, which augurs well for permanent success, is that it is self-supporting. This, however, is to be said, that the club started with a capital building in a most excellent situation, an advantage which it owes to the late Marquis of Westminster and the present duke, and a large number of benevolent donors. The subscription is only 10s. a year, with an entrance-fee of 5s., and there are at present about 1,200 members. The new structure is a large building, intended not only for the use of the club, but for letting to the public for meetings, lectures, concerts, and balls, &c., and thus to add to the funds of the institution. It consists of a hall, 90 ft. long, 32 ft. wide, and 26 ft. high, with a platform at one end and a music gallery at the other. The hall has been erected, from the designs of Mr. H. A. Hunt, jun., by Messrs. H. J. & C. Wilkes, and will cost, exclusive of decorations, between 3,500*l.* and 4,000*l.*, towards which the Duke of Westminster has contributed 1,000*l.*

The Amalgamated Society of Engineers, Machinists, &c.—In the twenty-fourth annual report of the Amalgamated Society of Engineers, Machinists, Millwrights, Smiths, and Pattern Makers, the general secretary remarks:—"In regard to the increase of members, we may state that on the last club night of 1873 we had 42,382, and on the last one of 1874 that number was augmented to 43,150, giving an increase of 768. Between the same periods twenty new branches were opened—namely, fourteen in England, two in Scotland, one in Ireland, one in Canada, and two in New Zealand, making the total number of branches at the close of 1874 to be 379. The geographical area over which the branches extend will be sufficient evidence to show that the influence and operations of our society are stretching into every quarter of the globe, where commercial civilisation has penetrated and found a home. We shall now draw attention to our financial transactions, and which we have found to be of a very satisfactory nature, for after meeting all our liabilities, we have been able to add to our reserve fund the sum of 38,066*l.* 9s. 3d. This, added to our balance at the beginning of 1874, which was 200,923*l.* 1s. 6¾d., gave us at the close of the year a reserve fund of 238,989*l.* 10s. 9¾d., or 5*l.* 10s. 9¼d. per member."

Borough Surveyor of St. Alban's.—A special meeting of the Town Council was held in the Council Chamber, Town-hall, on the 26th ult., to consider the application for the office of surveyor. At their last meeting, the Mayor said it was resolved that they should advertise for a successor to Mr. Colbron, which had been done, and they had received letters from four candidates. The first was from Mr. Ingram, the former surveyor, who again offered his services on condition that the duties of surveyor and collector were separated, as he could not undertake both. The other three applications were Mr. J. Colling, of Lambert; Mr. J. Cook, Southwick, Sunderland; and Mr. J. H. Duckingfield, of Rochdale. A lengthy conversation resulted ultimately in the adoption of a motion by Mr. Alderman Martin,—"That a special meeting of the council be called to take into consideration the desirability of rescinding the resolutions relating to the offices of surveyor, inspector of nuisances, and collector of rates, being held by one and the same person, and to rescind such resolutions if deemed necessary, and to make such orders thereon as shall be considered advisable."

Good Templars' Hall at Weymouth.—The foundation-stone of a Good Templars' Hall in High-street,—on a site adjoining the old Town-hall,—was laid on the 28th ult. The ceremony was performed by Mrs. Talbot Greaves, her husband, the rector of Melcombe Regis (the Rev. Talbot Greaves), also attending and delivering an address on the occasion. Mr. G. R. Crickmay is the architect. The new hall will consist on the ground floor of a coffee-room, 17 ft. by 15 ft. 6 in., together with bedrooms and sitting-room for the attendant, and an ante-room for the members, the whole of the first floor being devoted to a hall 45 ft. by 20 ft.

Breach of Contract.—At the Bedfordshire Assizes, an action was tried, before Baron Bramwell, in the Nisi Prius Court, John Pepper, brick-maker, Eversholt, being the appellant, and Benjamin Litchfield, contractor, Bedford, respondent. The cause of action arose in the refusal of the defendant to accept two quantities, viz., 100,000 and 50,000 of bricks, which plaintiff alleged he had agreed to purchase. Defendant's pleas denied the breach as regarded 6,100, affirmed the bricks were not of the proper quality, and asserted that a sum of 10*l.* 7s. 5d. paid into court was adequate remuneration for the bricks received. Mr. Pepper spoke to defendant coming to his brickyard in February last, and ordering the quantities of bricks as set forth in the action, having first examined and expressed approval of them. He affirmed the bricks sent were of exactly the same description as those examined. His Lordship said, inasmuch as defendant had used a portion of the 17,000 he must pay for the whole. It was for the jury to say at what price. The jury valued the bricks at 28s. per 1,000,—a verdict, in fact, for 23*l.* 16s., less the 10*l.* 7s. 5d. paid into Court.

The Trades Union Congress. — The Trades Union Parliamentary Committee have issued the following circular to the officers of the trades societies and trades councils throughout the United Kingdom:—"Gentlemen: The next trades congress is fixed to take place in Glasgow, on Monday, October 11th, and following days; we therefore request you to appoint your delegates without delay, so that they may be communicated with as the time approaches for the congress to assemble. In consequence of the position of the Labour Laws Bills in Parliament we are unable to determine the exact wording of our programme, but it will be issued as soon as the Bills have received the Royal assent and they have become law. The committee would urge upon those societies who have not yet sent their contributions to do so at once, as the expenses attending the work of the committee have been very heavy in connexion with the Labour Bills now before Parliament, and the work accomplished has been of the most important character." The circular is signed on behalf of the committee by "George Howell, secretary, 27, Villiers-street, Strand," and "Daniel Guile, treasurer, 200, New Kent-road."

Worcester Association for Building Dwellings for the Labouring Classes.—The twenty-first annual general meeting of the above association was held at the Guildhall, last week. According to the report then read, the governors "consider it imperatively necessary, from the position in which the association is placed, that the proprietors should authorise them to take at once the necessary steps for disposing of the property to the best advantage. They regret that they see no alternative, and are much mortified to be compelled, after twenty-one years of anxious solicitude for the welfare of the association, to propose that their labours should terminate in such an unsatisfactory manner." The financial statement showed an actual balance in hand of 13*l.* The mortgages upon the property amount to 2,200*l.* After some discussion the report and balance-sheet were adopted, and a special committee was appointed to arrange for the disposal of the property.

Building Operations at St. Luke's.—At the meeting of the guardians of the Holborn Union, on the 27th ult., Mr. Hopkins called attention to the state of the unfinished buildings in connexion with the St. Luke's Workhouse. These buildings are without a roof. During the winter the frost had affected the exterior, and now the rain was damaging the interior of the works. The time for the completion of the work had expired a month ago. He concluded by moving that the solicitor be instructed to write to the contractor, informing him that the Board would take urgent steps, and enforce the penalties if the contract be not completed without delay. Mr. Snell, architect, explained that the reason why the work was so behind hand was because there was a delay in the delivery of the ironwork. He further stated that he could not excuse the want of foresight on the part of the builder, and that he would be very glad if the builder could be made to move faster. He could say that as a rule builders had very great difficulty with ironfounders. After some further conversation, the motion was put and carried.

Great Chart Parish Church.—The work of re-seating the parish church of Great Chart, Kent, under the direction of Mr. Blomfield, architect, is now going on.

Ventilation of Glastonbury Kitchen.—In a recent paper read before the Bath and West of England Society, Mr. Neville Grenville, M.P., called attention to the system of ventilation employed in the great kitchen of the abbey, a building still almost, if not quite, perfect. The system must have succeeded in all weathers. The building is about 39 ft. square, and has a door in the middle of the south side, another opposite; a fireplace in each corner, and a window on every side. The high-pitched roof converges to an octagon lantern, with an upper lantern above it, so arranged that cold air entering at the lower one and meeting the air from below, both would blow out above and effectually ventilate the building, without excessive draught.

The Builders and the Hove Commissioners.—A numerously attended meeting of builders was held at the Albion Inn, Hove, on Tuesday in last week, for the purpose of taking into consideration the best means of obtaining an amendment of the Hove bye-laws, so far as they related to building operations in that district. It was stated that some portions of the laws were very oppressive and impracticable; and Mr. C. O. Blaber (surveyor) moved the adoption of a memorial setting forth the clauses complained of. This resolution was carried, and it was resolved that the memorial, when signed by the builders, should be presented to the Hove Commissioners by a deputation consisting of Messrs. Cheal, Eldridge, Lidbetter, Nurcombe, and Stenning.

The Wilberforce Memorial.—On the 26th ult., the memorial-stone of the late Right Rev. Samuel Wilberforce, D.D., Bishop of Winchester, was laid in the permanent church of St. Augustine's, the site of which is in Lynton-road, South Bermondsey. The church will consist of a chancel 40 ft. deep, 27 ft. 6 in. wide, and nave 77 ft. long, of the same width, with north and south aisles, 13 ft. wide. The chancel will have a square east end, with aisles running round to the north, south, and east sides 5 ft. wide. The church will seat about 900 adults, and will cost about 12,000*l.*, exclusive of steeple.

The Opera House on the Embankment. Mr. Mapleson has written the following letter to Colonel Sir J. M. Hogg, M.P.:—

"Sir,—I beg most emphatically to deny the statements made in the House by Colonel Beresford, with whom I have never had any communication, nor do I know that gentleman.

With regard to the appointment of the architect for the new Opera House, the design was selected by a committee from a large number that were sent in, and the architect's name was not known until afterwards.

No contract has yet been made for the erection of the building, but, in order to save time, Mr. Webster has, by the advice of the architect, been employed to prepare the land for putting in the foundations."

Dorking Church.—The south porch of the parish church, which the parishioners have undertaken to construct, as a token of their appreciation of the services of the Rev. Philip Hoste, during his residence in this town, is, we understand, to be commenced at once, and last week the architect, Mr. Woodyer, met some of the Hoste testimonial committee at the church, to discuss the matter. The porch will doubtless prove a useful as well as an ornamental addition to the church, and not more than about 40*l.* of the 370*l.* it is estimated the work will cost, remains to be subscribed.

The Hermann Memorial in Germany.—Extensive preparations have been made for a great national festival on the occasion of the unveiling of the colossal statue of Armin, or Hermann, the German hero who, according to Tacitus, effected the overthrow of Roman dominion by the battle in the Tentoburg Forest in the year 9 A.D. The colossal size of the monument, which has been erected on a hill near the place where the battle was fought, may be gathered from the fact of the statue, which is of iron, weighing not less than 145,000lb.

The Mayor Collection of Drawings.—Messrs. Hogarth, of Mount-street, have now on view the collection of original drawings and sketches by Old Masters formed by the late Mr. William Mayor, of Bayswater. The specimens are about 1,000 in number, and illustrate most of the different schools of Europe. The desire is to sell them as a whole. A good catalogue has been printed.

The Albert Medal.—At the request of the London Society of Arts, to find a fit person for the honour, the Royal Academy of Rome have selected the civil engineer, Grattoni—the surviving engineer of the Mont Cenis tunnel—as the recipient of the Albert medal.

Laying the Foundation-stone of a New Chapel of Ease, Tonbridge.—On the 31st ult. a distinguished company assembled in Dry Hill Park, to witness the foundation-stone laying, by Mrs. J. Deacon, of a new Chapel of Ease, which in future is to be known as St. Saviour's. The church, which is to be the gift of Mr. J. Deacon, will be built by Messrs. Punnett & Sons, from designs of Mr. Ewan Christian, and it is calculated that it will accommodate 450 seat-holders. The cost is estimated at about 3,000*l.*

Fever at Sevenoaks.—A special meeting of the Local Board was held at Sevenoaks on the 31st ult., to consider a report from Dr. Baylis, the sanitary inspector, as to the condition of the town. Dr. Baylis stated that forty cases of fever had come under his notice, and two others had just been reported to him. The fever arose from the existence of cesspools and the bad construction and filthy condition of certain buildings. It would be necessary to adopt a system of drainage, upon which he would further report.

An Elizabethan Cottage at Southleigh is attracting the attention of archæologists. According to local papers, among the carving is the emblem of St. Luke, and the shields have the crosses of St. George and St. Patrick, or St. Andrew, painted on them. This is supposed to be a portion of the reredos of the ancient altar of Southleigh Church. The date is said to be about Edward VI.'s time, and it is probably a relic of the taste and munificence of the Bonvilles, the ancient lords of Southleigh.

Value of Freehold Land in the City of Westminster.—An important site, comprising Nos. 53A, 53½, and 54, Parliament-street, containing an area of 2,363 superficial feet, was sold by auction, by Mr. Robins, of Waterloo-place, on Wednesday last week, for 17,400*l.*, being 7*l.* 10*s.* per foot. It is understood that the property was purchased on behalf of Mr. Mapleson, for the purpose of the new National Opera House and Royal Academy of Music.

Saxmundham Church Restoration.—A parish meeting was held at the Market Hall on the 29th ult. to receive a report of the receipts and expenditure of the fund raised for the restoration of the parish church and of the work done. The works were carried out under the direction of Mr. R. M. Phipson, architect; Mr. Grimwood, of Weybread, being the contractor. The total expenditure upon the restoration and enlargement of the church and chancel has been 2,614*l.* 3*s.* 9*d.*

The Lambeth Waterworks.—The new intake and reservoirs which have been constructed by the Lambeth Water Company at West Molesey have been inspected by a large body of the shareholders, whose visit, though ostensibly for business purposes, was not without the characteristics of a picnic party, owing to the provision that had been made by the chairman and directors for securing the comfort and pleasure of their guests.

Crystal Palace School of Art, &c.—The award of prizes to successful students in the classes for water-colour painting, taught by Mr. Edward Goodall, and for drawing from the figure and modelling in clay, instructed by Mr. W. K. Shenton, in the Ladies' Division of the Crystal Palace School of Art, Science, and Literature, was made on Saturday last. The judges were Sir John Gilbert, A.R.A., Mr. Louis Haghe, and Mr. T. Woolner, R.A.

Bristol and Gloucester Archæological Society.—A meeting to consider the advantage of forming a district archæological society was recently held at the Bristol Museum and Library, Dr. John Beddoe in the chair. The proposal for such a society originated with Mr. John Taylor, who submitted the scheme, which, after discussion, was unanimously adopted. A provisional committee was formed, and rules were agreed upon.

Strike of the St. Gothard Tunnel Workmen.—A strike of 2,200 men has occurred on the St. Gothard Tunnel works. They demanded the establishment of provision depôts by the contractors, and a rise of wages. A number of the men, armed, blocked up the Goeschenen (northern) entrance to the tunnel. A riot ensued.

Ornamental Ironwork.—The ornamental railings and gates at the Deaf and Dumb Asylum, Margate, recently opened by the Prince, and Princess of Wales, were executed by Messrs. Alexander Macphail & Co., ironfounders, Upper Thames-street, London.

Department of Science and Art Bill.—The Lord Chancellor, in moving that this Bill be read a second time, explained that it was rendered necessary by the form in which Sir Joseph Whitworth desired to secure his grant of 3,000*l.* a year to the Department for the Promotion of Science, and that it would enable the Department to take devises of land for this purpose if under the control of Parliament. The Bill was read a second time.

A Convalescent Home in Yorkshire.—Through the liberality of Mr. Charles Semon, J.P., of Bradford and Broughton Hall, near Skipton, a convalescent home for sixty inmates has been erected on the verge of Rombald's Moor, near Ilkley, Wharfedale, Yorkshire, at a cost of 8,000*l.*

Death of Mr. James Hughes, Architect, Charlemont.—The demise of this gentleman, on Saturday last, at his residence, Charlemont, is announced. The deceased was an architect of ability, and several ecclesiastical structures, and other buildings, attest his skill. He died at the comparatively early age of forty-eight years.

L'Association pour l'Avancement des Sciences.—This Association, which was founded in Paris at the conclusion of the war, on the model of the British Association for the Advancement of Science, having now arrived at its fourth year of existence, will hold its next annual congress at Nantes, in Brittany.

Strike at Dundee.—Thirty-one mills are closed, and upwards of 12,000 persons idle. An open-air mass meeting of the operatives was held on the 27th ult.; 10,000 men and women attended. It was resolved to continue the strike till the notices reducing the wages by 10 per cent. are withdrawn.

TENDERS

For Kentish rag walling and iron railing at Elmer's-end, Beckenham, for the Crystal Palace District Cemetery Company. Mr. A. G. Hennell, architect:—

Downs & Co.	£1,682 0 0
Willson, Brothers	1,597 0 0
Potter	1,198 0 0

For additional stables for Messrs. Crosse & Blackwell, in Crown-street, Soho. Mr. R. L. Roumieu, architect. Quantities taken out by Messrs. Welch & Atkinson:—

Dove, Brothers	£3,795 0 0
George Smith & Co.	3,760 0 0
Longmire & Burge	3,757 0 0
Holland & Hannen	3,649 0 0
Macey	3,561 0 0
Southcott	3,258 0 0

For the Fountain-road School, to accommodate 250 boys, 250 girls, and 250 infants, for the Kingston-upon-Hull School Board. Mr. W. Botterill, architect. Quantities supplied:—

Clarkson & Son	£7,530 0 0
Grassby	7,507 15 0
Stanley	7,500 0 0
Hockney & Liggins	7,216 0 0
Drewery & Harper	7,125 14 0
Habbershaw	7,065 2 6
Skinner	7,025 0 0
Sergeant	7,020 15 0
Musgrave	6,863 0 0
W. & J. Hall	6,578 0 0
Jackson*	6,420 0 0

* Accepted, subject to the approval of the Education Department.

For the erection of new school buildings, Codford St. Mary, Wilts. Mr. E. H. Lingen Barker, architect:—

Ford	£480 19 6
Scamell	440 0 0
Hopkins & Son	438 10 6
Gasford (accepted)	422 15 3

For the erection of lecture-hall, class-room, &c., Victoria-road Church, Leicester. Messrs. J. Tarring & Son, architects:—

Loveday	£2,840 0 0
L. H. & R. Roberts	2,580 0 0
Richards	2,508 0 0
Gilbert & Pipes	2,229 0 0
Boden	2,095 0 0
Bland & Sons (accepted)	1,985 0 0
Lighting.	
Rothwell	85 10 0
Webb (accepted)	65 19 0
Warming.	
Boulting	97 15 0
Gimson & Co.	67 5 0

For cemetery chapels, lodge, and entrance, for the Hampstead Rural Board. Mr. Bell, architect:—

Stimpson & Co.	£5,677 0 0
Gould & Brand	5,647 0 0
Scrivener & White	5,593 0 0
Manley & Rogers	5,417 0 0
Watts	5,416 0 0
Niblett & Son	5,389 0 0
Boyd & Jopling	4,990 0 0
Stains & Son	4,974 0 0
Hobson	4,843 0 0
Crabb	4,550 0 0

For decoration of St. Thomas's temporary church, Westbourne-grove. Mr. T. Hayter Lewis, architect:—

Hayward & Son	£237 14 0

For the erection of new middle-class school, Wretham-road, Handsworth, for Mr. E. Haywood. Mr. W. Tadman Foulkes, architect. Quantities by Mr. W. A. Phipson:—

Smith & Son	£1,233 0 0
Barker & Son	1,198 0 0
Bloore	1,172 0 0
Lidzey	1,160 0 0
Sapcote & Son	1,156 0 0
Steel	1,100 0 0
Hughes (accepted)	1,090 0 0

For alterations to a dwelling-house at Clapton, for Mr. J. Crook. No quantities supplied. Mr. Edward Clark, architect:—

Hunt	£810 0 0
Brightmore	744 0 0
Fox	669 0 0
Raby	649 0 0

For rebuilding No. 10, Little Tower-street. Mr. Sextus Dyball, architect:—

Croaker, Brothers	£3,570 0 0
Killby	3,420 0 0
Ashby, Brothers	3,399 0 0
Holland & Hannen	3,395 0 0
Patman & Fotheringham	3,256 0 0
Brass	3,217 0 0
Newman & Mann	2,948 0 0
Browne & Robinson (accepted)	2,864 0 0

For alterations to the Duke of Marlborough, Dalston. Mr. H. J. Newton, architect:—

Godden	£280 0 0
Shurmur	269 0 0
Boden	218 0 0
Larter	199 0 0
Wells (accepted)	187 0 0

For alterations to the Duke of Sussex, Islington. Mr. Newton, architect:—

Boden	£240 0 0
Wells	225 0 0
Taylor	197 0 0
Hockley (accepted)	190 0 0

For repairs to the Duke of York, Somers-town. Mr. Newton, architect:—

Hockley	£134 0 0
Shurmur	117 0 0
Boden (accepted)	115 0 0

For alterations and decorations to St. Bride's Church, Fleet-street. Messrs. Arding, Bond, & Buzzard, architects:—

Hayward & Son	£1,255 0 0

For the erection of a pair of residences, at Edgbaston, Birmingham, for Mr. E. L. Tyndall. Messrs. Payne & Talbot, architects. Quantities by Mr. T. H. Mansell:—

Moffat	£3,277 0 0
Briley	3,200 0 0
Parker & Son	3,027 0 0
Partridge	3,000 0 0

For the erection of a residence, at Edgbaston, Birmingham, for Mr. H. W. Whitmore. Messrs. Payne & Talbot, architects. Quantities by Mr. T. H. Mansell:—

W. & J. Webb	£2,830 0 0
Wilson & Son	2,800 0 0
Smith	2,770 0 0
Briley	2,700 0 0
Jones & Son	2,699 0 0
Partridge	2,500 0 0

For stabling, coach-houses, and attendant's rooms (exclusive of fittings), at Aske Hall, Richmond, Yorkshire, for the Earl of Zetland. Quantities by Mr. George Connell. Mr. Thomas Oliver, architect:—

Gradon	£12,387 0 0
Millar	12,112 0 0
Reed	12,026 0 0
Whitely	12,020 0 0
Shaw	11,936 0 0
Simpson & Co.	11,716 0 0
Allison	11,540 0 0
Elliot	11,298 0 0
Keswick	11,180 0 0
Watson	10,750 0 0
Yeo	10,550 0 0
Armitage (accepted)	10,345 0 0

For the erection of house, shop, and warehouse, in High-street, Wapping, for Mr. J. T. East. Mr. Charles Dunch, architect. Quantities by Mr. G. P. Raggett:—

Read & Son	£4,200 0 0
Palmer	4,190 0 0
Johnson	3,770 0 0
Killby	3,740 0 0
Perry	3,739 0 0
Ennor	3,712 0 0
Elkington	3,683 0 0
Outhwaite & Son (accepted)	3,597 0 0

For new concert-hall and alterations to the Town of Ayr public-house, Canning-town. Messrs. Ingram & Hollands, architects. Quantities supplied:—

Atherton & Salter	£725 0 0
Curtis	680 0 0
Stephenson	680 0 0
Moreland & Nixon	630 0 0
Heiser (too late)	623 0 0

For a house in Waddon-road, Croydon:—
Ridge & Kingsland, accepted.

TO CORRESPONDENTS.

A. M. (thanks).—T. W. (shall appear).—J. C. K. (shall appear).—W. H. W. (shall appear).—C. P.—L.—H. & Son.—P. Brothers.—L. L.—J. K.—H. M.—C. I.—T. & Son.—J. W.—Dr. S.—Dr. O. D.—G. [illegible]—E. P.—A Bricklayer.—T. O.—J. E.—A. J. W.—W. T. F.—W. H. G. V. & M.—W. W.—S. D.—H. S.—T. & R.—J. O. & Son.—Several communications in type are unavoidably postponed.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, list of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

The Builder.

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ILLUSTRATIONS.

Old Brompton, now South Kensington:—View of the Old Brompton road, near the "Hoop and Toy," as seen from Onslow-terrace in 1833; Part of Methwold's Almshouses (1879) 732
The Fire Brigade Station in the Commercial-road, London (Plan, 735).—Mr. George Vulliamy, Architect 733

CONTENTS.

Church and School Architecture 721
Garibaldi and his Port of Rome Scheme 722
The Underground Population 723
"Indian Notes" in *Macmillan's Magazine* 724
The New Masonic and Public Hall, Camberwell 725
The Holborn Scheme under the Artisans' Dwellings Bill 725
Houses without Sewers 725
Sale of the Materials of the Bow and Camberwell Halls 725
Whitworth Scholarship Prizes 725
Underground Apartments, Oxford-street 725
Church Building News 725
Dissenting Church Building News 726
Rusting of Iron in Water 727
Dwellings of Danish Workpeople 727
Hyde Park Corner 728
The Pharos at Dover, and the Remains on the Western Heights 728
Crystal Palace School of Engineering 729
Inner Circle Completion 730
The Inhabited House Duty and Poor-Rate; What Constitutes a "House"? 729
The Champion Rock Borer 730
The Proposed Sanitary and Educational Exhibition at Brighton 730
Concrete Slab Cottages 731
Tools and Contrivances used in Handicraft 731
The Shaftesbury Park Estate Company and the Wandsworth Board of Works 731
Old Brompton, now South Kensington 731
The New Fire Brigade Station, Commercial-road 735
Look after your Cisterns 735
Large Farms and Small Farmers 736
The French Excursion of the Architectural Association 736
"The Universal Artist" 736
Berwick and Newcastle 736
Caution to Builders and their Housekeepers 737
New Congregational Church, Wellingborough 737
Bad Materials under Metropolitan Building Act 737
Salaries of Municipal Surveyors and Engineers 737
Clay a Mineral 737
General Foremen and Clerks of Works: Bricklayer v. Carpenter 737
Alleged System of Defrauding Masters 737
Medical and Architectural Sanitation 738
Cremation 738
Taylor's and Tobin's Ventilators 738
School Board Schools 738
School Building News 738
Village Home for Girls, near Ilford 739
Newbury Public Offices Competition 739
Easton-square 739
Purbeck Marble 739
Building Societies 739
Appointments 739
Stained Glass 739
Books received 739
Miscellanea 740

Church and School Architecture.

ONE who read some remarks on the above subject by a correspondent from the other side of the Atlantic, printed in our last number, will require to be told that their appearance in these columns did not necessarily argue the endorsement, on the part of the *Builder*, of each and all of the sentiments expressed. Indeed, considering how a good many of the observations of our American critic flew in the face of some of the most cherished associations of English architects and churchmen, even some portions of them which privately we might not dissent from at all, might have been modified in expression, on Lord Chesterfield's principle that it is not wise to speak the whole truth at all times and in all places. To do so is sometimes to startle into opposition those who, by a more moderate statement of the case, might have been gained as allies.

It is always useful, however, to have the sentiments of those who see a thing in a different light and under different circumstances from our own. In this country we are so much governed by sentiment and association in regard to such a subject as church architecture, for instance, that it is difficult to realise how our practice in this department appears to those who are not under the same influence. Our New York friends, on the contrary, have nothing of this sort to hamper them, no ecclesiastical past to look back to, and they reduce the problem to the conditions of sheer utilitarianism, with a thoroughness of purpose which leads to a somewhat bald and unsatisfying result. Much of what is urged in Mr. Henderson's letter has been, it is true, brought forward by ourselves, not merely once nor twice. We have always discouraged the sentimental symbolism of the ultra-ecclesiological party of church-builders in England; we have even, so far as could be at all consistent with the objects of this journal, gone out of our way at times to expose the folly, from a higher point of view, of a great deal that is going on in the matter of ecclesiastical ceremony at present. On the other hand, however, the American view of the matter is deficient, from our standing-point, in not taking into account the really important influence of sentiment and association, in regard especially to the architecture of buildings so much more than utilitarian in their objects as churches seem to us to be. Of course we must remember, also, what our American critic seems to forget, that the current view of the nature and requirements of a church service must necessarily have its effect on the architectural treatment of the building. If the service is Mediæval the church must be so; and if it were really to appear that the Church of the present day had made up its mind to masquerade in the ecclesiastical guise of the pre-Reformation period, the manifest duty of the architect is to supply, when called upon, the kind of building necessary to carry out the illusion completely. Whatever his private opinion, it is his business not to argue, but to build. Leaving out of question this contingency, however,—believing as we do that the bulk of English worshippers have not made up their minds to any such state of things,—there is still the double influence of association and architectural effect to be considered, in addition to the mere practical healthiness and comfort of a place of worship. The New York ideal of a church seems to be simply a place where every one can sit comfortably, breathe unvitiated air, and hear a preacher. This is the common-sense side of the matter, and far be it from us to disregard or under-rate it. Proper atmospheric regulation in churches is especially a matter of absolute necessity; at least, one would think so if it were not so habitually neglected. Our complaint in regard to English churches, however, has not been mainly that of deficiency of ventilation, though that often exists. An interior so lofty in proportion to its area, and with so much air space, as is the case in many Gothic churches, old and new, does not present much difficulty in the way of ventilation, and, except in very hot and calm weather, will to a great extent ventilate itself. The complaint against the neo-Gothic church, as well as the Mediæval cathedral, on sanitary grounds, is more generally on the score of draughts and insufficient warming, when warming is necessary. We know that serious and sometimes fatal illnesses have often been traced, especially in the case of delicate women, to exposure to cold and draughts in a breezy church, with a large expanse of cold substances—cement, stone, tiles,—around and under foot. So far the complaint against a large number of modern churches, on the ground of discomfort and unhealthiness, is fully sustained. There is no reason why, in the name of religion and church principles, we should subject ourselves to colds and bronchitis. But whether the church is the place for the development of "every modern convenience" may be a question. The fact is that this is a very self-indulgent and luxurious generation; and for all who are blessed with average means, the opportunity of making themselves exceedingly comfortable wherever they go is provided to an extent which is calculated, we think, to enervate and effeminise the rising generation. We should hardly be sorry to see the church, almost the one place of general meeting where it is still admitted that all are on an equality, retained also as the one place from which this over-wrought luxury of the present day is banished, and where a degree of comfort not beyond that which is within the reach of the poorer class is also accepted as sufficient for the time for the needs of the wealthier. If there is any sense or meaning whatever in a great deal of our established form of worship, and in much of what is adopted as the prevalent tone in Dissenting worship also, a church is a place where people are supposed to go in a certain spirit of humility; and we can hardly therefore see the suitability of imparting to its furniture and fittings all the luxury and comfort which meets us in too exaggerated a form, often, in the modern drawing-room. If simplicity, and absence of self-indulgence and ostentation, are but too little characteristic of the domestic life of the day, let these qualities at least be retained in the *appareil* of our places of worship. Any other principle would seem, in England, like a returning to the old days of the squire's pew, with its curtains and cushions, marking it off from the seats for the humbler brethren. Then in regard to the general question of the utilitarian arrangement of churches, in plan as well as in details, there is this to be said,—and it is a consideration which cannot be put on one side,—that the Mediæval form of church, however inconsistent with many of the requirements of modern worship, has been connected for centuries with the English idea of a place of worship. In some respects its practical unsuitability has been a little over-rated; for instance, it is stated on scientific authority that the three-aisled form of building is by no means acoustically unfavourable: it is certain, at any rate, that the same area roofed in one span often proves exceedingly troublesome to the speaker. Other points may be objectionable, and may be susceptible of modification without entirely destroying the association of the old form of church. And it is certain that this association is a powerful element in the feeling with which a place of worship is regarded among us. It may be all very well in New York to make a church into a kind of lecture-room in appearance and plan; but in England nine persons out of ten would not feel that they were in church at all in such a building; and we cannot regard their prejudice as entirely trivial or unreasoning, any more than the feeling which makes a man reluctant to pull down an old and inconvenient house with which all the recollections of his past life are connected. We have never supported mere archaism in church building, and have often urged reformation in it, but not transformation—not that wholesale application o the every-day economies and patents of building which would sweep away all that we have so long connected with the idea of a church. That would be a one-sided proceeding.

Then as to the question of architectural effect. Most of the ideas of utilitarian reform in church building include the extinction of the monumental character of church architecture, and the reduction of the church to the type of a curtained and cushioned theatre or assembly-room. This amounts, in our thinking, to a wanton obliteration of one of the few opportunities for impressive building left to us, and an absolute loss in regard to the relation of the building to its object. Owing to the luxurious habits of modern life, before referred to, it is but very rarely that we can have a chance of producing architecture in its severer form, not smothered beneath a coating of upholstery. Surely a class

of buildings the object of which is not utilitarian and which are intended not as permanent dwellings, but as temporary meeting-places on special occasions of mental and spiritual aspiration, may very well be retained as the most fitting opportunities for the higher forms of architectural expression. We may go further than this, and say that they are thereby more fitted for their object. There is a good, whether consciously perceived or not, in the effect of an interior on the minds of those assembled in it; and certainly the tone of devotional seriousness must be rather helped than otherwise by the substitution of architectural design, properly so called, for the mere wall-paper and curtain type of finish. For the poorer classes especially this is worth remembering; for to many of them the church, with its arcades, its stained windows, and its music, is, apart from all other considerations, the one bit of something like poetry that finds its way into their lives. Our American correspondent is sweeping in his condemnation of stained windows, as "a custom that has descended from a superstitious age." This is a very New York way of looking at it, and certainly incorrect, unless in a very qualified sense. A great deal of the style of design produced in stained glass at present does, it is true, partake of such a character as that indicated; but that is no necessary quality of stained-glass design, nor need it be such as to unduly darken the interior,—it is better not so, in fact. But stained glass is a beautiful means of giving effect to an interior; nor are we at all sure of the superiority, from any point of view, of the too-garish light of large clear glass windows. In country churches, indeed, there is sometimes less to be said for stained glass; for often the outer landscape, seen through the windows, has more of beauty and suggestiveness than the cunningest worker in stained glass could supply. In one place, perhaps, it is the rich masses of foliage of the adjoining trees which fill up the window; in another the side or outline of a hill; and so on. But in town churches, where a great deal of the surroundings may perhaps be squalid and repelling, or, at best, dull and respectable, stained glass is most invaluable in shutting out the outer world, and giving to the interior a kind of "glamour" and repose, which is to many persons at least most refreshing and restful in its effect. It is possible that the feeling for this kind of repose in the church interior scarcely exists or is understood in the States; but it certainly exists among us, nor is it a feeling by any means to be scouted or derided. And, therefore, while deprecating and, indeed, opposing all attempts at sensational and theatrical ornament and ritual, we do by no means at present wish to see our churches deprived of their architectural and monumental character.

The architecture of schools is, our American correspondent thinks, yet in its infancy, and he may be right. We have hardly arrived at the perfect architectural form of a school yet, though a good many different attempts have been made. On the whole, we may say that the exteriors of our schools are too utilitarian, and the interiors not utilitarian enough. Deficiency of ventilation and imperfection in the system of warming are defects only too common, and the more noticeable as their results in a crowded school are very serious. The present school-building movement is doing a good deal to improve matters in these practical respects, but in general absolutely nothing to ameliorate the state of school architecture. School boards, in fact, are ostentatiously indifferent to this. A case came under our notice, in which a school board in a large town had asked by circular for suggestions, from several head-masters or superintendents of schools for primary education, in regard to any special points which they thought needed improving. One of those who replied had the good sense to add to his other recommendations a remark that architectural interest and style should be considered a matter of importance, as the character of a building had certainly an influence on the children who were educated in it. The administrators of education, however, were proof against any such sentimental nonsense, and appended to this paragraph formally the note, "The Board do not take this into consideration at all in accepting plans." That was at least honest, and probably the gentlemen who made the statement had not the slightest idea that they were doing anything else than exercising a conscientious and salutary check upon unnecessary expenditure. The buildings erected for the London School Board are by no means carelessly carried out in regard to architecture; but in most cases they present little that is attractive, even in their present state, and will look like so many factories when properly coated with smoke and dirt. As a general rule, the architectural aspect of schools is too stern and forbidding looking. We should prefer to see a somewhat more home-like and domestic aspect given to them; in country schools this sometimes is done, and may very often be done equally well in town schools. Architecture is never better employed than in giving an inviting and attractive air to buildings such as these, which too often present a gloomy, prison-like character, not calculated to decrease the natural antipathy of the rising generation to being caught and confined for their own good. Schemes are being mooted for making children's education more amusing and attractive to them than it has generally been. Towards such an end the architect might at least be permitted and encouraged to do what he can in his own province.

GARIBALDI AND HIS PORT OF ROME SCHEME.

During the months of March, April, and May of the present year, there appeared, from time to time, in the daily papers telegrams, letters, and even leading articles on the subject of a scheme for the diverting of the Tiber, and the construction of a "Port of Rome" at Fiumicino. From these it appeared that General Garibaldi was about to add fresh lustre to his renown by becoming as pre-eminent in the arts of peace as he had been in the art of war. It appeared, too, that England, which, as the General remarked in a letter on the subject of these works, has done so much for Italy, was to participate in the glory of the undertaking, in the person of Mr. James Wilkinson, of Westminster, the engineer entrusted with the construction of the harbour. Recently nothing has been heard of the matter, and the public are left to suppose that all is proceeding in successful course. But, unfortunately, such is not the case; and we can fully understand the unwillingness of the journals to disparage one who has deserved so well of his country. It seems desirable, however, to give a short history of the transactions as it has reached us.

Mr. Wilkinson was introduced to General Garibaldi several years ago by the American Consul, and renewed the acquaintance on the 28th of January last by a letter from London, in which he offered his services in connexion with the important public works then contemplated. On the 1st of February the General answered this letter, saying how glad he would be to accept the support, especially of the English, who had done so much for Italy. Mr. Wilkinson went to Rome immediately, and an interview took place on the 7th of February, at which the General explained his views (which were afterwards greatly modified) and made arrangements for an excursion down the river to inspect its course and select a spot for the construction of a harbour at Fiumicino, a small town on a branch of the river from which it takes its name.

The General made the excursion on the 11th of February, accompanied by Mr. Wilkinson, who four days later received instructions, in the presence of an English gentleman, to prepare plans for the port. These instructions were repeated the following day in writing, and, relying implicitly on these engagements, Mr. Wilkinson proceeded, with the assistance of three engineers, who came from England for that purpose, to prepare plans; and as time was a great object, and the weather very bad, he hired a steamer in order to take the soundings, and completed these operations on the evening of the 6th of March. Having lost no time in submitting the preliminary plans to the General, Mr. Wilkinson received an answer from him, in which he expressed his satisfaction therewith, and requested that the detailed plans might be made, so that he might present them "to the Government for their approval, to the Province of the Municipality, to the Commission, and to the National Parliament, whose approbation is indispensable to the carrying out of such a great and important project." Mr. Wilkinson, therefore, at once commenced the drawings of the detailed plans, and on the 2nd of April they were completed and presented to the General, who went carefully through them, and expressed himself entirely satisfied.

On the 12th of April Garibaldi signed a demand to the Government for the concession for the port, it being always understood that he was to transfer the concession to the company to be formed, and that Mr. Wilkinson and those gentlemen, if any, whom he chose to associate with himself, were the only parties acting for the construction of the port. On the 13th of April Mr. Wilkinson, in company with Mr. Menotti Garibaldi, presented the demand for the concession, accompanied by the plans and documents which he had drawn up, to the Minister of Public Works. It was favourably received, and the Superior Council approved the plans, only suggesting certain modifications, consisting chiefly in a wider entrance to the port. The matter proceeded satisfactorily up to the end of April.

However, at a conference at the General's house, held on the 6th of May, in presence of Mr. Baccarini, who came on behalf of the Government to arrange the exact words of the concession, the General produced a plan for the port, drawn up at his request by the architect Landi (who was then present with Semenza, Renzis, and other professional men), and requested that an arrangement should be made with him.

At this time, in consequence, as it appeared, of a statement made to General Garibaldi by General Fabrizis, which had emanated, there is good reason to believe, from Mr. Semenza, to the effect that a gentleman connected with the affair had offered to sell the concession for 250,000 francs (the said gentleman being in no position to do such a thing, besides being the most unlikely person to contemplate it, if he were), the General's tone altered so much that a remonstrance became necessary.

He was, therefore, reminded by letter that arrangements had been made in England, America, Austria, Prussia, France, and Hungary for finding the money; that this had been done, and the plans prepared, on the understanding that Mr. Wilkinson was to construct the port; that he had in writing accepted and approved the terms and drawings submitted to him; and that the matter had proceeded satisfactorily to within a few days of the date of the letter. His request, or rather demand, that an arrangement should be made with Landi, and the fact of his having commissioned De Renzis to settle the terms of the concession for the port of Rome with Mr. Baccarini, were referred to, and it was pointed out that those engaged in the construction of the port should settle the terms of the concession, and that the interference of Messrs. Landi and Renzis was uncalled for and unjust.

The General returned no answer to this, but received Mr. Wilkinson in a friendly way on the 10th, and requested him to return with another gentleman on the 12th. This they accordingly did, and submitted to Garibaldi a short draft agreement in which they bound themselves to construct the port, and to form a syndicate or company for that purpose, and he on his part engaged to leave the arrangement of the project entirely in their hands. He appeared satisfied with it, only adding a few words, and asked them to call with a fair copy of it in the morning, which they did: he then, however, much to their surprise, refused to sign any agreement at all, and even to give them a letter to the effect that when the company was formed he would transfer the concession to it. He said,—"Form a company; when I see they have spent a large sum in the port, I will transfer to them the concession." Of course, no capitalist would ever spend money on such terms.

The General quite ignored the rights of those he had employed, and has not since proposed any arrangement to remunerate them for three months of their services, and a large expenditure of money in preparing the project for him. Mr. Wilkinson finally wrote to General Garibaldi announcing his intention of withdrawing altogether from the undertaking. This letter has not been answered, nor have the plans been returned, as was requested.

This affair, if the statements made to us are correct, is almost sufficient to deter capitalists from investing their money, and professional men from risking the loss of their time and labour in a land the people of which are so intensely "national," that they will decoy, by fair-seeming engagements, a foreign engineer to devote himself to their undertakings, and, when they have obtained the benefits of his skill, band together to deprive him of a part, or, if he will not submit quietly to that, the whole of the fruits of his labour; endeavouring, meanwhile, to make their peace with the world by putting forward an improbable tale.

A description of the proposed port cannot fai

to be interesting, even though it should never be constructed.

The port was to have been situated close to Fiumicino, about sixteen miles from Rome. The approved drawings showed two moles running out from the shore, the southern one 2,050 mètres in length, and the northern one 1,698 mètres; the two inclosing an area of about 118 hectares. The depth of water at the entrance to the harbour would have been nine mètres, so that the largest vessel would have been able to enter. A railway was to have been made from the existing Rome and Civita Vecchia Railway at Ponte Galera Station direct to the Port, and along its northern mole, at the extremity of which the trucks would have been loaded direct from the ships by means of steam cranes. This railway would have passed over only seven miles of country remarkable for its flatness. By means of Trajan's canal, which is about two miles long, water communication along the Tiber to the City of Rome was secured; and to stop the silt which is at present brought down, a lock was to have been constructed at its junction with the river.

The moles, as shown, were constructed entirely of large blocks of concrete (composed of lime, puzzolano, and small stone), weighing 25 tons each. The facilities for this mode of construction are very great, as all the materials occur on the site. The northern mole, 40 ft. wide, was paved with Caprera granite, from the General's quarries, and had a perpendicular face next to that port where the ships were shown to lie. The base of the moles, as shown, was nearly 100 ft. wide, in order to distribute the bearing over as large an area as possible, on account of the alluvial nature of the sea bottom. The total cost of the port, including a lighthouse on the southern mole 25 mètres high, built on cast-iron piles, and fitted with a revolving light, but exclusive of the lock near the Tiber, was estimated at 600,000*l.* sterling.

The entrance of the Port was shown, 150 mètres wide, and accessible to vessels in all weathers, being extremely well protected from heavy seas and prevailing winds and currents. As this port would have been the most central in Italy, and so near the city of Rome, a very large traffic was expected; and the great railway facilities offered an additional inducement to its development. Civita Vecchia now takes the bulk of the coal and other heavy traffic for the city; but it is fifty miles off, and is consequently disqualified for competition with a genuine "Port of Rome."

It was calculated that, taking the port charges as only 1f. per ton, they would yield a revenue of 40,000*l.* sterling per annum; and, as the cost was to have been only 600,000*l.*, the affair promised to be a great commercial success.

THE UNDERGROUND POPULATION.

According to the latest returns, 538,829 persons are employed in Great Britain and Ireland in getting and bringing to bank, and distributing, coal, fire-clay, ironstone (in layers, as distinct from iron ore), and shale; of whom 428,611 work under ground, and 110,218 above ground. The Coal Mines Regulation Act includes fire-clay, ironstone, and shale, and the Metalliferous Mines Regulation Act includes all other mining produce. In these latter mines, in Great Britain and Ireland, there are employed 62,306 persons, of whom 35,283 are under ground, and 23,700 above ground in Great Britain, and 1,855 under ground, and 1,468 above ground in Ireland.

This latter Act has a more extensive application than its title indicates. It regulates the operations of mines of flagstone, freestone, limestone, slate, rock-salt, and lignite, as well as the metallic ores; but in one case,—the great slate quarries or mines of Festiniog,—the owners declined to conform with the Act, upon the plea that their works are not mines. At the time the inspector of mines for that district (Mr. T. F. Evans) made his report,—March 27th, 1875,—the matter was left to the Court of Queen's Bench for settlement. In the case of the mineral produce included in the Coal Mines Regulation Act, the inspectors of mines are able to give not only the number of accidents and of deaths proportionate to the number of persons employed under and above ground, but to the number of tons of produce; but in the case of those minerals included in the other Act, an immense reduction takes place in the quantities of some of them in the process of dressing to which they are subjected in order to make them marketable, so that the calculation of any such average of quantity raised to lives lost as that made for the coal mines would only mislead; but, comparing the accidents with the number of persons employed, there appears to have been one fatal accident for every 663 persons employed, and one death in every 604; and distinguishing between the underground and surface workers the ratio is one death in 417 under ground, and one in 1,797 above ground.

Under the former Act there were produced from the mines of Great Britain and Ireland, in 1874, 126,590,108 tons of coal, 2,067,791 tons of fire-clay, 11,693,186 tons of ironstone, and 362,747 tons of shale (principally oil-shale).

In 895 fatal accidents, 1,056 persons were killed, in the same year, in and about the same mines. There were no fatal accidents or deaths in Ireland in 1874; but in Great Britain one fatal accident happened amongst every 602 persons employed in or about the mines, or one death by accident amongst every 510 persons employed. In the same year there was one fatal accident for 157,222 tons of mineral raised, or one death by accident for 133,251 tons.

Mr. James Willis, F.G.S., the inspector of mines for the county of Westmoreland, South Durham, and the North Riding of Yorkshire, shows that the

Number of persons employed in his district in 1874 was	65,541
Tons of mineral raised	23,844,628
Separate fatal accidents	94
Lives lost by accidents	96
Persons employed per separate fatal accident	697
Persons employed per life lost	682
Tons of material raised per separate fatal accident	253,655
Tons of material raised per life lost	248,381

Mr. Willis says of children:—"I have not met with any case of boys being allowed to enter pits under the age specified in the statute; moreover, I do not think there is any disposition on the part of the employers or their officials to permit this. I am of opinion that there is much more readiness on the part of parents, and I speak from experience, to send the children to work under age. I do not speak of the workpeople generally, but of a class among them,—the idle and dissolute." A woman with (say) a couple of workers, would, according to the custom of this district, be entitled to occupy a house rent-free, and a sufficient allowance of fire-coal at a nominal cost of sixpence a fortnight. Mr. Oakley, one of the inspectors of schools, has had frequent complaints from the teachers that boys are permitted to work under age; but, "probably owing to the dependent position, to a certain extent, which the teacher occupies in regard to the colliery owner," no names or cases have been brought under the notice of the inspector of mines.

Plans and elevations are given of houses now being built for miners in the county of Durham, for which no rent is charged. They are built in rows, with small back-yards, as usual. A small pantry is put out into the yard from the kitchen, which is also the scullery. An objectionable feature is an open ashpit within 4 or 5 yards of the pantry-window, and 5 or 6 yards of the back-bedroom window. If these were a little further off, and if the ashpits were so covered as to wholly exclude rainwater, while at the same time admitting a full and free play of air across and under the roofs, it would be a great improvement. But we believe it to be very unwise to provide workmen with houses rent free. It seems too much like providing stabling, &c. If a man is able to work he is able to pay rent, and what is wanted of colliery proprietors and other employers is that they should provide a healthy house at a moderate rent for every family, any one of whom is employed on the works. To induce men to continue to work at a particular colliery by finding them houses rent free is to be too kind.

Curiously enough, the water-rate,—2d. per week, each house,—is charged to the tenants. The water-supply is the first thing which should be made free. There is an incongruity, which is most striking, in providing houses rent free, and charging the tenants with the water-rate. It leads to this inference,—that it is necessary to the commercial success of the mine that persons be induced to continue to work it, but that the state in which they live meantime need not be considered. On this principle it follows that houses should be rent free, which at once strikes a blow at the freedom of the miner and makes him dependent, but that if he require the luxury of a supply of water he must pay for it. The device is worthy of a "political economist." And if the professor of a true science object that this device does not come within the scope of political economy, he has himself to blame in that he allows mere trade rules to be dignified with the name of his science.

The Midland district of England, of which, Mr. Thomas Evans, F.G.S., is the Inspector, comprises the counties of Derby, Nottingham, Leicester, and Warwick. The average number of tons of coal raised per annum per life lost during the last eighteen years was 113,525, whereas in 1874 the quantity was 222,405 tons. There were raised last year in this district nearly twelve millions and a quarter of tons. There were but but three fatal explosions of gas in the year, and they were attended with the loss of three lives; although twenty-nine other persons were more or less injured by explosions at different times. It was in Mr. Wynne's district, North Staffordshire, Cheshire, and Shropshire, where explosions of fire-damp made such havoc in the year 1874, causing at five collieries the death of seventy-eight persons, including fifty at the Astley deep pit at Dukinfield on the 14th of April, 1874, plans of which are given, showing the workings and the air-ways; and Mr. Wynne shows pretty plainly what was the cause of the accident.

Mr. Lionel Brough, F.G.S., Inspector of Mines in the South-Western district, comprising the counties of Gloucester, Monmouth, Somerset, and portions of Brecon and Glamorgan, gives 101,199 tons per life lost in 1874, in the coal, fireclay, and ironstone mines. In the other class of mines in his district there were raised 203,502 tons of hematite iron ore, 461 tons of lead, and 75,224 tons of oolite or Bath freestone, in procuring which one person was killed for 139,593 tons produced.

It appears that while many children of ten and under thirteen years of age are employed in most of the mines of Great Britain, few, in comparison with the numbers of older persons employed, work in coal-mines in Ireland. Mr. Joseph Dickinson, F.G.S., reports upon North and East Lancashire, and upon Ireland, that the following numbers of persons were employed in 1874 under the Coal Mines Act:—

	In North and East Lancashire.	In Ireland.
UNDERGROUND.		
Boys of 10 and under 12 years of age	278	0
" 12 " 13 "	1,012	1
Male young persons of 13 and under 16	3,184	61
Males above 16	22,692	1,053
ABOVE GROUND.		
Boys of 10 and under 13	139	1
Girls " "	4	0
Male young persons of 13 and under 16	282	24
Female ditto	24	0
Women above 16	120	2
Males "	5,093	504

Mr. Ralph Moore, Inspector of the Eastern District of Scotland, furnishes in some respects the best report; for he gives the mode of working each mine, the thickness of the seam, the particulars of the ventilation, the depth of the shafts, &c.

Mr. William Alexander, Inspector of the Western District of Scotland, gives a table showing that in one mining locality as many as five persons were killed in the year 1874 per 1,000 employed, although in other parts of his district the average was not more than 1·6 per 1,000, and these in both cases not by explosions, but by falls of the roof and sides, in shafts, &c.

In the Yorkshire district, including Lincolnshire, Mr. Frank N. Wardell, F.G.S., is the inspector, and he states the number of persons employed in the year 1874 at 62,499 above and below ground, who produced 14,827,313 tons of coal; 181,819 tons of fire-clay, and 212,777 tons of ironstone; making a total of 15,221,909 tons of mineral, which gives a proportion of about 244 tons to each person employed. The number of lives lost was 112, giving a proportion of one death to 135,910 tons raised. There were 88 fatal accidents, and in 85 of these one person was killed in each case. Of the remaining three, one occurred at the Oaks Colliery, where, by a very large fall of roof, two men were killed; one at Wincobank Colliery, near Sheffield, where an explosion of gas killed two; and the other at Rawmarsh Colliery, where an explosion of gas killed 23. On the 20th of November, 1874, there were about 460 persons at work in the whole colliery, and the amount of air which was passing up the up-cast shafts, of which there were three, was something like 110,000 cubic feet per

minute; and, trusting wholly to the good ventilation, the men were using naked lights. Colliers do not like the Davy lamp—the safety-lamp mostly used—because it does not give them sufficient light; but Mr. Wardell said in his evidence at the inquest that "I have a very decided opinion that it would be unsafe to work this seam here with any other lights than locked safety-lamps, and I recommend, after much experience of the qualities of different lamps, the Stephenson, as being, under all the circumstances, the safest which a miner can use"; and in his report he says, "Good ventilation is indispensable: there can be no two opinions about that; but it is not everything; and the use of safety-lamps ought not in any way to weaken it; the one is not a substitute for the other. The whole body of air throughout a mine does not require to be brought to the firing point before an explosion can take place"; and he further says "I am more than ever confirmed in my opinion that for the ordinary working collier the Stephenson is the safest lamp he can use, locked by the best known means, and that seems to me to be a rivet. . . . . I think that for the purpose of detecting gas there is no lamp so good as the common Davy, and for this reason I hold it to be the best lamp which a deputy or fire-trier can take with him in his examination."

"INDIAN NOTES" in *MACMILLAN'S MAGAZINE*.

Sir,—I shall esteem it a favour if you will publish this rather long letter for the purpose of eliciting precise information from some of your Anglo-Indian readers concerning the remarkable statements recently made in *Macmillan's Magazine* by Mr. James Routledge,—a gentleman who confesses to have written upon Indian topics as far back as sixteen years ago, and who has had "unusual opportunities" of testing the facts and possibilities he enumerates, and of which he is at once the historian and the prophet. Far from disputing the conclusions of his political arguments, I am disposed, probably from a too slight acquaintance with the subject, to agree with them; but I hope he has better authority for his premisses in matters of policy than he seems to consider necessary in archæological science.

In the first "Notes" published in the July number of *Macmillan* he is in conversation with the commandant of the Fort of Morar, who, while justly condemning the modern barracks and similar public works, points to "a certain domed building" which, says the commandant, "is the only rain-proof place I have for the Queen's Stores, although it has stood 2,000 years." It would appear, then, that there is a domed building in or near the Fort of Morar almost contemporaneous with the Parthenon,—for a traveller with unusual opportunities of learning the truth would hardly retail an absurd exaggeration. But from the very beginning of his notes, Agra is the one place to which he religiously turns, and Akbar the one being to whom he fondly recurs. In spite of statistics of population, which he must have by heart, he is astonished to find that "in going down the narrow streets of Agra, the very stones existing along which Akbar drove, you hardly meet with a European face,"—a note which he has developed in the August number of the same magazine, wherein he describes:—

". . . . The streets of old Agra paved with blocks of stone, like London streets now. . . . . You know that the stones under your carriage-wheels are the very same upon which the magnificent Akbar and others drove in days when other races ruled in this fine city; that the life, rich or poor, is identically the same life in nearly all, if not all, leading characteristics as that which existed here when the wolf and the wild boar he'd revel in England. . . . . You turn from this to the fort,—the fort of Akbar. . . . . From its walls you see the Taj, standing out like a fairy palace in the wilderness. . . . . You are shown the Somnauth Gates, which Lord Ellenborough made so famous; the guns captured by Sir George Campbell,—famous surely for that. . . . . Then you have that throne of Akbar, beyond all question the grandest judgment-seat in the world. . . . ."

Sir, the books I have consulted show that the great emperor came to the throne of Hindustân 319 years ago; and I infer that he sometimes rode upon an elephant. But the double picture of the "magnificent Akbar" driving upon and along the streets of Old Agra is entitled to the licence always accorded to poetical imagery, although an Indian gharry, even with a Mogul sovereign upon the box, savours less of the sublime than the ridiculous. Then what were his cattle,—bullocks, horses, or a camel? In London streets carriage-wheels do not roll over what are known as blocks of stone; and if the comparison be intended to apply to London footpaths, I venture to say that these are paved with slabs of stone, bordered with granite curbs; while at old Agra the red sandstone covers the whole surface of the roadway. To poor architects, who are taught to judge by analogy—by modes of construction, types of mouldings and ornaments—and by constant reference to historical facts, the slender verandahs, balconies, and kiosks, which grace the winding streets of the native city, do not seem to be those from which people doubtless witnessed the progresses of Akbar. Their delicate details seem to be rather of Shâh Jehân's time. And if there is very little left in Agra of Akbar's buildings, there is surely less remaining to show that the older city of the Afghan kings was situated exactly on the spot now occupied by native Agra,—which is on the right or western bank of the river Jumna. The Emperor Bâber, founder of the Mogul dynasty, and father of Humâyun, who immediately preceded Akbar, is said to have lived on the left or eastern bank (where the railway station is), and his body, before it was carried to Lahore, was deposited at the Râm-Bâgh, on the same side of the river. Is it not likely that Agra, the city of Akbar, was founded in the sixteenth century just as modern Delhi, the city of Shâh Jehân, was founded in the seventeenth upon a virgin site? If so, how about "the wolf and the wild boar"? In Calcutta, jackals still "hold revel" towards the small hours of the morning; and possibly, during the reign of Henry VIII., the wolf and wild boar had greater facilities of revelling in the suburbs of London than they enjoyed a century later. But is native life in Agra now exactly the same as it was even in the sixteenth century, when its streets must have been inhabited, not only by skilled artisans and rich merchants, but by other more ornamental, if less useful, members of society? And the fort, is it that of Akbar? The oldest buildings within it,—probably remnants of Akbar's palace,—are named after Jehân Gheer, his successor. They are of red sandstone, and portions are put together according to absolute principles of wood construction, resembling some of the buildings at Futtehpore Seekree, known to have been built by order of Akbar. But the external gateways and fortifications are veneered with slabs of red sandstone much thinner than the ashlar facing of a London house-front, and cannot be ascribed to workmen of his school. From those walls the Tâj may possibly appear to the eyes of a theatrical critic like "a fairy palace in a wilderness," whatever that may be. To mine, about two years and a half ago, it seemed to be laid amongst foliage and flowers richer and brighter than any to be found in the richest park and brightest garden in all England.

The reference to the "Somnauth Gates" is no doubt innocently made in the belief that every one knows the known facts of their story. But those pine-wood gates, carefully preserved in the fort at Agra, are covered with ornaments which (according to Mr. Fergusson, and lesser authorities) bear no resemblance to early Hindu work. Lord Ellenborough was, of course, sincere when he declared them to be the same gates which, report says, were carried away from India into Afghanistan by Mahmoud of Ghaznee, who lived at the end of the tenth and beginning of the eleventh centuries. That they are not is certain; and to quote Mr. H. G. Keene, than whom few Indian civilians have a better right to be heard upon archæological questions, there is no real evidence that Mahmoud, who destroyed the Temple of Somnauth, carried away from its ruins any gates at all. Then there are "the guns," which are "famous surely," because Sir George Campbell "captured" them! Why more famous than if any other member of the Civil Service of Sir George's age and experience had taken them? Or is the assumption only an adulatory figure of speech, acquired from residence in what florid correspondents call,—"the East"?

Sydney Smith, when in a serious vein, considered that the Emperor Aurangzeb was "an object quite as stupendous as the Alps." The throne of an ancestor ten times nobler than Aurangzeb, may, therefore, not improperly be called "the grandest judgment-seat in the world." But where did Mr. Routledge see Akbar's throne? It is certain that that emperor administered justice in public and in front of his throne, but there is even less to show that what is styled Akbar's throne at Agra is genuine, than that the extraordinary red-sandstone building, an exact copy of which is in the architectural room at the South Kensington Museum, was used for a similar purpose by the same emperor at his palace twenty-two miles from Agra.

Mr. Routledge takes infinite care to impress his readers with the fact that his notes are recent. He visited Cawnpore when "men of mark" (meaning possibly Mr. Disraeli's "superior person") believed that the real Nâna had at last been caught. He varied the monotony of a railway journey with "Dave Carson's jokes," which it seems even then maintained their hold of the Anglo-Indian mind. He went to a "calico ball" at Lucknow, where a gentleman dressed as a barrister was mistaken for Dr. Kenealy. He parenthetically explains that the "Secundra Bâgh," near that city, merely means "garden;" although a page or so further he is "shocked to find that Alexander the Great has left little in India but a name." Yet long ago works of sculpture were discovered, and others are even now being disinterred, which bear indubitable traces of Greek influence or inspiration; at least of men who had been familiar with the followers of Alexander. It is, perhaps, waste of time to carp at what after all is only slipshod writing. But let it be remembered that between this and the prince's return next summer tons of "copy" relating to India will probably be prepared for home consumption. Contributors to a publication so deservedly esteemed as *Macmillan's Magazine* should seek to instruct as well as interest their readers. "Notes" of a similar description, sometimes collected from between the Venetian blinds of a railway carriage, are gradually getting fashionable; and, interlarded with pig-sticking adventures and botanical addenda, are, doubtless, entertaining to a large number of educated people. But a man of "unusual opportunities," and an evident friend of India like Mr. James Routledge, ought not to treat its archæology in so loose a fashion as to perplex even those who can detect the padding, and read between the lines of his rhapsody.

William H. White.

P.S.—Agra has been called Akbarâbâd, the city of Akbar. Mr. Keene, above mentioned, the author of the newest "Agra guide," says that "it had been a residence of the Lodi kings, and was occupied by Bâber after he had defeated Ibrahim Khan, in 1526. The foundations of the Fort of the Lodis are said to be still traced on the *left* bank of the Jumna." He makes no allusion in his book to any buildings now existing within the fort of Agra older than the reign of Akbar. But Mr. Fergusson, in the Indian section of his "History of Architecture," says that "the finest, and perhaps the best of the palaces built by the Pathâns, in India, was that built at Agra by Sheer Shâh. . . . . Being the *first*, it had the misfortune to be placed on the highest spot within the walls of the fortress. Hence the present enlightened Government of India pulled it down and replaced it by a more than usually hideous brick erection of their own." Further on Mr. Fergusson alludes to "a fragment that remains"; and I conclude that this fragment is the red sandstone building called after Jehân Gheer. Anyhow, it is not older than the sixteenth century; for Sheer Shâh defeated Humâyun in 1540, and occupied his throne for five years. To quote Mr. Keene again, "It is believed that the founder of the fort was Saleem Shâh, son of Sheer Shâh, who held power during the interregnum of Humâyun (A.D. 1545–53). . . . It is not known that any fragments of the older buildings still remain, that mentioned by Fergusson as having survived the British demolitions being considered by the natives as having formed the drum-stand of Akbar's palace, and being entirely in the style of that monarch's time."

W. H. W.

The Sale of Berwick Mansion and Estate.—The sale of Berwick mansion and estate, a fine residence in the county of Salop, took place at the Raven Hotel, Shrewsbury, on the 6th inst. It consists of a substantially-built mansion, and an extensive park. The timber was valued at 21,000*l.*, which was what it would realise in the market from any timber merchant. The rental is 2,965*l.* By various bids, varying from 1,000*l.* to 5,000*l.*, 171,000*l.* were reached, at which price the mansion and estate were knocked down amid much cheering. The amount given was exclusive of the value of the timber. The estate contains about 1,800 acres of first-rate land, and 190 acres of woods and plantations.

THE NEW MASONIC AND PUBLIC HALL, CAMBERWELL.

The New Masonic and Public Hall in Camberwell New-road, which has for some time been in course of erection, will shortly be completed and opened. That portion of the building intended to be devoted to purely Masonic purposes is already finished, and has just been inaugurated, and the hall for general public purposes is in a forward state, and will be ready for occupation during the approaching autumn. The Camberwell New-road elevation of the building is about 25 ft. in height, with a portico entrance in the centre, ornamented with carved Masonic emblems, and above, a tower, terminating with a conical dome and cresting, rises to a height of 54 ft. The front portion of the building contains the apartments intended to be used by the different lodges connected with the craft. These consist of a large banqueting-room, together with a decorated lodge-room, with several anterooms and corridors. The front entrance leads into a hall, or vestibule, which is elaborately finished and decorated, the floor being laid with ornamental encaustic tiles.

The public hall, now in course of erection, is at the rear of the building, and it will have a separate entrance at the east end, as well as that in the front, the first-named entrance being that by which the public will be admitted on occasions when the Masonic apartments and the public hall are in use at the same time. The public hall will be 80 ft. in length and 40 ft. in width, and will seat an audience of upwards of 1,000 persons. It will have a platform and orchestral accommodation at one end, together with retiring and cloak rooms, and at the opposite end there will be a gallery. It is intended to be used for public meetings, lectures, and musical and other entertainments.

Messrs. Payne & Clark are the architects; and the contractor is Mr. Oliver, of Camberwell.

THE HOLBORN SCHEME UNDER THE ARTISANS' DWELLINGS BILL.

The Metropolitan Board of Works on the 6th inst. took action for the first time under the Artisans' Dwellings Bill, recently passed. They adopted by a considerable majority a report from the Works Committee stating that, in the opinion of the committee, certain houses, courts, and alleys within the area represented by the medical officer of health for the Holborn District Board, are unfit for human habitation, and in such a sanitary condition as cannot be effectually remedied otherwise than by an improvement scheme for the re-arrangement and re-construction of the streets and houses within such area or some of them, and recommending that an improvement scheme be made in respect of such area, and that it be referred to the engineer and superintending architect for that purpose. The Board also took exactly similar action in regard to certain houses, courts, and alleys within the area represented by the medical officer of health for the Whitechapel District Board, brought before them in the same manner. Many years ago and often since we brought prominently into notice the frightful condition of most of the courts behind Gray's Inn Lane, using for the purpose the pencil as well as the pen. It is not likely, therefore, that we shall be regarded as desiring to throw any difficulties in the way of their removal, and the substitution of healthful residences, if we press upon the Board and its officers the necessity of moving by degrees. To pull down the whole of the houses in Mr. Isaacs's scheme, including the renovated Tyndall's Buildings, without first making some provision for lodging the inhabitants, would be to produce an amount of misery and distress scarcely calculable. The number of persons dispossessed, according to the schedule given with the original scheme, would be 3,661.

One item of this schedule has considerably annoyed the Society for Improving the Condition of the Labouring Classes (Lord Shaftesbury's Society), and has led to a correspondence. In this schedule Mr. Isaacs has entered Tyndall's Buildings as comprising nineteen houses, 151 families, and a population of 608. Mr. Charles Payne, on the part of the Society, states that the number of families is 86, and of persons only 321.

Dr. Gibbon, the medical officer of health, agrees with him in thinking that there must be some mistake in the schedule, and testifies to the excellent sanitary arrangements of the Court, but all the reply he can get from the surveyor is that "Mr. Stannard, the assistant inspector of nuisances, took the numbers, at my request, some two or three months ago, and he assures me he was very particular in his inquiries, as also in entering in his book the particulars which were furnished to him at the time"; and "that it is quite the custom of the tenants to deceive their landlords as to the number of their children; that is to say, on application for a room or rooms, a person will state that the family consists of one or two children, when in reality there are four or five."

Surely, however, Mr. Payne must know.

HOUSES WITHOUT SEWERS.

It transpired at the meeting of the Rotherhithe Vestry last week that there are a number of houses in that parish which are without sewer connexion. The attention of the Vestry was directed to the fact that the houses in Abbey-field-road, Southwark Park, had been occupied for some time, but that the sewers had not been put in the road, the result of which now was that the temporary cesspools had overflowed, and the yards were covered with sewage. The surveyor explained that the work was not put in hand because the whole of the owners had not paid their instalments for the work. It was remarked that it was very hard upon those owners who had paid that the work should not be proceeded with, and it was resolved that the necessary work should be carried out, and the defaulting owners summoned.

SALE OF THE MATERIALS OF THE BOW AND CAMBERWELL HALLS.

The departure of Messrs. Moody and Sankey for America was followed last week by the sale of the materials of the two halls which had been erected for their services at Bow and Camberwell respectively by Messrs. Perry, the contractors. The sale took place by order of Messrs. Perry, who, under the building arrangements, were entitled to the materials. The sale was conducted by Messrs. Fuller, Horsey, & Co. The materials of the Bow Hall were divided into 158 lots, the slates not being included, and the sum realised was a little more than 1,000*l*. The materials of the Camberwell Hall consisted of 140 lots, which fetched about 850*l*. The contract price for the two buildings was about 6,000*l*.

WHITWORTH SCHOLARSHIP PRIZES.

We gave last week the names of the successful candidates in 1875 for Whitworth Scholarships; the following is a list of those who have gained Whitworth Scholarship prizes, 1875:—

William Martin, first prize, 100*l*.; William Sisson, second prize, 80*l*. (specially increased to 80*l*. for the great advance made since he obtained the Scholarship); Thomas L. Daltry, third prize, 50*l*.; Robert A. Sloan, fourth prize, 40*l*.; Frederick Stubbs, fifth prize, 30*l*.

UNDERGROUND APARTMENTS, OXFORD STREET.

As the workmen in the employment of the Chartered Gas Company were laying down a main pipe opposite to Stratford-place, Oxford-street (in the middle of the road) they came in contact with some brickwork of a very hard nature. Having ascertained that there was no sewer in that part of the road, the men applied their pickaxes with vigour, and it was discovered that they had come upon the crown of the arch of a brick subterranean building, containing several rooms in a fairly good condition. The principal chamber opened is described to us as about 17 ft. long, by 8 ft. wide, and about 7 ft. high. It included some small freestone pillars, the angles of which were chamfered, and some small (window?) openings. The apartments communicated one with another, and had about 2 ft. of water in them and much foul air. It is to be regretted that no one able to pronounce as to the age or purpose of the construction appears to have seen it. The Tyburn, a brook that rose near Hampstead, and ran south into the Thames (and which gave to the gallows at the end of the Edgware-road its name, Tyburn Tree), crossed Oxford-street at this same spot, namely, opposite Stratford-place, and made its way by Lower Brook-street to the Green Park. It may be supposed, therefore, that the constructions to which we have referred had some connexion with the brook. Another suggestion is that they were connected with the Lord Mayor's Banqueting House, which formerly stood near the spot.

CHURCH BUILDING NEWS.

Earlestown (*near Warrington*).—The foundation-stone of the intended new church at Earlestown, has been laid by Mrs. Legh, of Lyme. The church is to be dedicated to St. John the Baptist. The architecture is of the Transitional Early English Period. The portion now intended to be built, of Yorkshire stone, comprises half the nave and aisles, transepts, chancel, and vestry, and will accommodate 600 persons, a piece of land being reserved for a future addition. The site has been presented by Mr. W. J. Legh, the lord of the manor, who has also given a donation to the building fund of 1,500*l*., and 500*l*. towards the endowment fund. Messrs. Whitley (son of the rector) & Fry, of Dover, are the architects. Mr. Joseph Pennington is the builder, and Mr. J. W. Randle, clerk of the works.

Redditch. — The increasing population of Redditch has rendered necessary extended church accommodation, and on the 30th ult., Lady Mary Windsor Clive laid the corner-stone of a new building intended at first to be used as a chapel of ease to the parish church, but in all probability to be developed into a separate living. The site of the new edifice, near the Beoley-road, was given by Lady Clive, and considerable progress has already been made with the work. About 3,000*l*. have been raised, and it is estimated that about 7,000*l*. will still be required to complete the building. The plans for the new church were prepared by Mr. F. Preedy, of London, the builder being Mr. T. Garbutt, of Malvern Link. The style will be Gothic, with clearatory and bell-turret at the east end of the nave. The church will consist of a nave, 70 ft. by 30 ft.; side aisle on the north, 70 ft. by 8 ft. 6 in.; choir and chancel, 30 ft. by 20 ft. 6 in. It will contain 400 sittings, 200 of which will be free. The building will be of the local Hewell rubble stone, with Bath stone dressings, and there will be an open-timbered roof. The aisle will not at present be completed, but the north will be built temporarily, so that the aisle can afterwards be added.

Ely.—The chief stone of the new church for the district of Colham has been laid, the edifice being dedicated to St. Etheldreda. The dimensions are:—Nave, 24 ft. by 48 ft.; chancel, 17 ft. by 24 ft. The church will be faced with Elton stone, with Bath stone dressing, and there will be a bell-turret at the west end for two bells. The roofs are to be constructed of open timber, stained and varnished, and plastered between the rafters. The vestry will be on the north side of the porch. The church will hold about 170 persons. Mr. W. Smith is the architect.

Killowen (*Derry*).—The parish church of St. John, Killowen, near Derry, having undergone extensive alterations, has been consecrated and formally opened by the Bishop of the diocese. The old edifice has been almost entirely rebuilt. Traceried cut stone windows of Early Decorated type supersede the old ones; the walls have been lowered; and a highly-pitched roof replaces the former one, with a bell-cot, 70 ft. high to apex. The east end of the church has been enlarged, a new chancel and robing-room having been added, as also a side-entrance porch. All the windows are filled with tinted rolled cathedral quarry lights. The roofs are open, that of the nave ceiled at the hammer-beam, with stained and varnished timbers. The open benches, pulpit, and fittings are of pitch pine varnished. The chancel will be inlaid with encaustic tiles, and also the porch and passages. The heating is by Porritt's underground stove. The church is lighted by floriated and gilt wrought-iron standards in the nave, and corona in the chancel and porch. The general works were performed by Messrs. M'Clelland & Co., Derry; the gasfittings by Messrs. A. D. Williamson & Co.; and the varnishing and painter's work by Messrs. J. & D. Baxter, Coleraine. Mr. J. G. Ferguson, Derry, was the architect.

Addlethorpe (*Lincolnshire*). — This fine old church has been partially restored. All the old oak benches, with their carved heads, have been carefully preserved, and where necessary restored.

The ugly deal pews have been swept away, as also has the rotten floor, and in their place a new floor and open benches have been introduced. The work is being carried out under the supervision of the curate in charge (the Rev. J. Whitworth), and the woodwork has been entrusted to Mr. Lowis, of Ingoldmells. The stonework of the south-east window has been rebuilt, Ancaster stone being used, and the whole has been completed by Mr. Smith, stonemason, Spilsby. The interior restoration will cost about 300*l.*

Roxby.—On the 28th ult. this village presented a festive aspect, on the occasion of the re-opening of the ancient parish church of St. Mary, after a thorough repairing, including new roofing and reseating, under the direction of Mr. Fowler, of Louth, the diocesan architect. The church consists of a short wide nave and aisles, a spacious chancel, western tower, and south porch, with a new organ-chamber on the north side of the chancel. A tower arch has been inserted in place of the old last-century doorway.

Dinting.—Holy Trinity Church, which was consecrated on the 31st ult., by the Bishop of Lichfield, has been built from designs and under the superintendence of Messrs. Mills & Murgatroyd, architects, Manchester. It consists of nave and clearstory, 74 ft. by 26½ ft., and 19½ ft. high to the apex of the roof; north and south aisles respectively 74 ft. and 60 ft. long by 8½ ft. wide, and 20 ft. high; chancel, with octagonal apex, 28 ft. by 18 ft.; organ-chamber, 16 ft. by 13 ft., forming externally a transept on the south side. There is also a vestry on the north side of the chancel. At the west end of the south aisle is the tower, 18 ft. square, with angle buttresses tapering upwards, and finishing with pinnacles, from the base of which springs the octagonal spire, measuring in all 137 ft. from the ground to the top of the vane. The exterior of the church is of stone. The style is that of the latter part of the thirteenth century. The main entrance-porch is under the tower. A spiral staircase leads to the belfry, in which is hung a peal of six bells, by Warner & Sons. In the interior, the piers dividing the nave from the aisles are of stone, circular, with moulded caps and bases. The walls are lined with cream-coloured brick, relieved by bands, &c., of warm brown, the arches, window-jambs, &c., being in moulded brick. The roof is open-timbered, lined with boarding, stained and varnished, the principal ribs carried on stone moulded corbels, the windows glazed with cathedral tinted glass, the seats open, of pitch-pine, varnished. The chancel roof has moulded groining ribs, filled in with boarding, all varnished, with carved bosses at the apex; the ribs are supported on stone corbels, carved with figures representing angels with musical instruments, &c. The building will seat 450 adults, and is warmed by one of Whitaker's convoluted stoves. The contract, amounting to about 6,500*l.*, was taken by Mr. Southern, of Manchester, the sub-contractors being Mr. Cordingly for masonry, Mr. Hamilton for brickwork, Mr. Lightfoot for plumbing and glazing, Mr. Dovey for gas coronal and vane, Mr. Oppenheimer for chancel tiling, &c. Mr. Bonehill, of Manchester, has carried out the carving.

Garlands (near Carlisle).—The new chapel, for the use of inmates of the Cumberland and Westmoreland Lunatic Asylum at Garlands, was opened on the 6th inst. by the Bishop of Carlisle. It stands in its own grounds on the left side of the road, in approaching the Garlands from Carlisle, and is quite detached from the asylum itself. Mr. Cory, the architect, has adopted a simple rendering of Perpendicular Gothic in carrying out the design, the chapel being planned with a special view to the reception of its inmates—a separate porch being made for each sex, and the passages being unusually wide. The nave is 80 ft. long by 30 ft. wide; the chancel is 26 ft. 6 in. by 17 ft. 6 in.; and there is a small vestry. The church is well lighted by side windows, and a large east window of four lights divided into traceried sections; and the timber of the roof, the top of which is 41 ft. high, is treated in a simple but ornamental manner. There is sitting accommodation for 300 persons in the nave; seats are provided in the chancel for the medical superintendent and his establishment, the reading-desk and pulpit being on either side of the chancel arch. A square tower, 41 ft. high, is surmounted by a spire 20 ft. higher. The building has been constructed of the red sandstone of the district, by Mr. Charles Armstrong, of this city. The estimated cost was 2,286*l.*

DISSENTING CHURCH-BUILDING NEWS.

York.—During the last three years the Wesleyan Methodists have held services in a school-chapel in the neighbourhood of Cemetery-road and Melbourne-terrace. To meet the requirements, however, of an increased population, it was resolved to build a new chapel, and the foundation-stone has been laid. Two plans were proposed by Mr. Edward Taylor, architect, Stonegate, in this city,—one for a building in the Gothic, and another in the Italian style,—and after discussion the latter was agreed upon. Tenders were advertised for, and out of forty the lowest amount was 6,689*l.* 16s. 9d., exclusive of site, internal fittings, &c. The chapel will accommodate 850 persons, and about 200 seats will be free. An additional schoolroom and several vestries have been added, so that 450 children will be provided for. The principal front will be in Melbourne-terrace. The internal dimensions of the chapel will be 87 ft. by 51 ft. 6 in., and 37 ft. high. The seniors' schoolroom, which will be on the ground-floor, will be 45 ft. by 27 ft., and 17 ft. high. The stewards' vestry, 23 ft. by 15 ft.; four class-rooms, 18 ft. by 13 ft. The tower will be placed over the principal entrance, and will be 90 ft. in height. The ceiling will be panelled and moulded, and the wood-fittings stained and varnished. The total area of the site is 1,604 square yards. The estimated cost is 7,000*l.*

Hatfield Heath.—The foundation-stone of a new Congregational Chapel has been laid here by Mr. Isaac Perry. The site is an extension of that of the old chapel, and the estimated cost is 3,300*l.*, the contract being for 3,000*l.* Mr. Cornell, of Bishop Stortford, is the contractor, and Mr. Banks the architect.

Halifax.—The increasing Stannary congregation having rendered the present building inadequate for the requirements of both chapel and school, the erection of an edifice on the adjoining vacant land for the purpose of the former was resolved on, and the corner stones have been laid. Subscriptions were promised to the amount of 5,737*l.*, which left a balance of only 2,300*l* to be raised. The plans of Mr. F. W. Petty, architect, were approved, and by these plans extra school accommodation will be afforded. From the basement a wide stone staircase will communicate with the church over, and forward to the gallery. The entrances will be from Stannary-street and Alma-street, communicating from side to side with wide lobbies, in which will be stairs to the galleries. An arrangement is also made for the scholars in the school adjoining to pass from the school floor direct into the gallery, to seats appointed for them. Seating will be provided for 1,500 people in the body of the church and galleries. The design is in the Gothic style. At one angle will be a tower with plated spire. Internally the building will be divided into aisles and nave, with iron pillars supporting moulded arches, in the spandrel of which will be clearstory windows. At the pulpit end of the church the recess usually occupied by organs in chapels is to be opened out, and a five-light stained glass window placed at the east end. The total amount of contracts is 7,000*l.*, distributed among the following: — Masons, B. & R. Hopkinson; joiner, James Smith; plumber and glazier, R. P. Stafford; slaters and plasterers, A. Bancroft & Son; painters, White & Stringer; ironfounder, J. Berry.

Norwich.—The new Baptist chapel which has been erected on the Unthanks-road, for the accommodation of the Rev. T. Wheeler and his congregation, has been opened. The building is from the designs of Mr. E. Boardman. The plan is that of a "church," with nave, aisles, and an apse, and is in the Early Gothic style of architecture. It is faced with Kentish rag stone, with Bath stone dressings. The nave has an open Memel timber roof, and is divided into panels by the moulded principals, purlins, &c. It is lighted on each side from above by ten clearstory windows. The arcading dividing the nave from the aisles is on either side supported by four red Mansfield stone columns, with moulded capitals. The apse is octagon-ended in form, and is lighted with three windows, filled with stained glass of geometrical pattern. Two of these are memoral windows. The string course along these windows is wrought stone work. All the windows are glazed with cathedral glass. The pulpit is on the north side of the entrance to the apse, in which are seats for the choir and space for an organ. Within the railing at the front of the apse is the baptistery. There is a small gallery at the south end capable of accommodating about sixty persons. Sunday school work will be carried on in suitable rooms below the church. The contract was for 4,770*l.*, but there are extras to the amount of 350*l.* The contractor was Mr. J. Harrison, and the sub-contractor for the brickwork Mr. J. Barnes, and for the stonework Mr. J. R. Childs. To Mr. Harvey was entrusted the glazing; to Mr. Pank, the gasfittings; and to Mr. North, the plastering.

Chester.—The congregation of the Independent chapel in Commonhall-street, finding that a new church, affording larger scope for usefulness, was imperatively required, the site in Upper Northgate-street was secured, and the work of building was commenced soon afterwards. The plans of Mr. T. M. Lockwood, architect, of this city, were adopted. The style of the building is that of the thirteenth-century Gothic. The gabled front to Northgate-street is of white Storeton-hill stone, and has on the north side of it a square tower of the same material, which, at the height of 42 ft., becomes octagonal, and is then pierced by eight or ten belfry-lights, terminating with a broach spire and vane, at a height of 100 ft. In the gable is a large five-light lancet window, having broad stone mullions, with detached shafts of red Mansfield stone, with carved caps and bases. Below, the vestibule, which is 7 ft. wide, is lighted by four lancet windows, and on each side of it are the main entrances, through porches, the doorways being enriched by shafts of red granite, with carved caps and bases. The length of the interior is 72 ft. 6 in., the width 38 ft. 6 in., and the height 32 ft. 3 in. to the ceiling, and 42 ft. to the ridge. The principals of the roof are shown, and, like the other woodwork, are of pitch-pine, stained and varnished. The pulpit, which stands in a recessed moulded arch, with black marble shafts and white stone capitals and bases, is of the same wood, carved. The seats are open, having book-rests and hat-rails. Accommodation is provided on the ground-floor for 500 persons. On each side of the church are six double-light lancet windows, having detached black marble shafts, with carved caps and bases of white stone, in front of mullions, which are of moulded bricks. On the exterior, these windows are divided by buttresses, capped with stone. Artificial light will be supplied by three large pendants from the principals of the roof, and the building will be warmed with hot air. The contract was let to Mr. Thomas Richards, of Upper Northgate-street, to erect the building for 3,240*l.*, sub-letting the stonework to Messrs. Cooke & Moulton, and the brickwork to Messrs. W. & J. Vernon. The total cost is estimated at 4,400*l.*

Halton.—The opening services in connexion with Trinity Wesleyan Chapel have been held. The buildings were erected from designs by Mr. C. C. Ellison, of Liverpool, architect, and consist of chapel, vestry, and school-room; the former having seats for about 300, and the latter 200 persons, all on the ground floor. The style is Gothic, and the chapel is arranged with an aisle on each side, entered by porticos and vestibules from the front, with a good hammer-beam roof, and diagonal-boarded ceiling, with perforated panelling in the centre, for ventilation. The front gable is filled in with two three-light windows with traceried heads, and the sides with couplets, the other end being occupied by a chancel, with moulded and decorated arch, polished marble shafts, Caen stone carved caps, &c., and a four-light traceried window, filled in with stained glass. A reredos fills in the space beneath the window, having a centre bay over the communion-table, and arcades on either side, all in Caen stone, with clustered shafts of variegated polished marbles, and the panels filled in with zinc plates, decorated in colours and gold. The pulpit and font are of Caen stone, each having polished marble clustered shafts and inlays of marble in the panels. The font is the gift of the contractor, Mr. C. Holland, of Chester. The woodwork is pitch-pine, stained walnut and parts ebonised. For the exterior, blue stone from Wales for walling is used, with dressings and mouldings of white stone, and shafts of polished red granite. Messrs. Brown & Downing, of Birmingham, supplied the metal work and gasfittings; and Messrs. Holloway, of Liverpool, the stained-glass work.

Constantinople.—Serkis Bey, the principal architect of the Palace, will, it is stated, be entrusted with the construction of the Bagdad Railway.

RUSTING OF IRON IN WATER.

With a view to investigate more fully the action on iron boiler-plates of soda, lime, chloride of barium, and other substances commonly used for the prevention of "scale," Professor A. Wagner, of Munich, lately instituted a series of experiments, which are detailed in recent numbers of the *Bayerisches Gewerbe u. Industrie Blatt*, and the *Deutsches Industrie Zeitung*, and of which the following is a summary :—

The mode of experiment adopted was to subject small strips of iron, cut from a single plate, to the action, first, of a given quantity of distilled water (75 cubic centm.), and afterwards of aqueous solutions of the various substances in use as "scale-preventives." In this way it was demonstrated how rust forms at ordinary temperatures. Subsequently, the conditions were varied: for one whole week the solutions were saturated with pure air, by means of an aspirator connected with a receiver containing potassium; for another week a current of air charged with carbonic acid was passed through them. At the end of each period, the strips were taken out, carefully, washed and dried, and weighed; the quantity of iron in each bath being determined by analysis at the same time. These were the results :—

In distilled water saturated with a mixture of atmospheric air and carbonic acid, iron was found to rust twice as fast as in distilled water saturated with pure atmospheric air.

In well-water concentrated by boiling the results were very different. Oxidation was there most active when the water contained pure air, and this irrespective of the salts present, except in the case of those having an alkaline reaction. In water containing chloride of barium and lime, and saturated with atmospheric air freed from carbonic acid, iron rusted very energetically. Oxidation proceeded less rapidly when the air contained carbonic acid. A contrary result was obtained with the chlorides of potash and soda, and even with sal-ammoniac and chloride of magnesia.

In one experiment oil was added to well-water, and the latter boiled down to the requisite volume,—75 cubic centm. Here oxidation was much less active in the presence of pure air than with an admixture of air and carbonic acid.

Substances with an akaline reaction, as lime and soda, were found to prevent the formation of rust altogether. This has long been known. Hütten has asserted that the formation of rust is prevented only so long as the oxygen of the air is not absorbed by the solution, and that such absorption takes place more slowly in saline solutions than in pure water. Professor Wagner believes that he has proved that saline solutions absorb as much gas in given times as pure water.

Wishing to ascertain how far the foregoing results were modified by the presence of heat, the Professor instituted a second set of experiments, in which the water was kept boiling by day, and allowed to cool and absorb air from the atmosphere by night,—the conditions thus being closely analogous to those to which water in ordinary boilers is subject. With distilled water, the loss of weight in the iron, or, in other words, the amount of oxidation, was found to increase from week to week, so long as the trial continued. With well-water (giving 0 gr. 76 c. of residue) iron rusted more slowly, and the loss of weight at the end of six weeks was just one-half only of what it was in distilled water. The carbonate of lime in well-water is therefore, a pretty effectual preservative against rust.

On adding a little chloride of barium to the water, the iron at the end of six weeks was found to have lost about the same weight as in the preceding instance, but the comparison of the weights at the end of each week of the period showed that oxidation had proceeded more regularly and uniformly. In solutions of the chlorides of barium and soda the loss of weight on the iron, at the end of six weeks, was slightly less than in pure water: during the first two weeks it was very rapid, and afterwards slow and uniform in degree. On the other hand, in solutions of soda and potash, the loss of weight was greater than in pure water, and, as in the last case, more rapid at first than afterwards. This appears to confirm the popular view of the deteriorating action of sea-water on ships' boilers.

The same phenomenon was observable when a neutral solution of chloride of magnesia was used. At first the rusting was very energetic; then slower in its action; latterly, very slow indeed. In this case, as it was feared the magnesia might decompose with the heat, and liberate hydrochloric acid, sufficient lime was added to neutralise the effects of the latter should it make its appearance. In this way, the oxidation of the iron was somewhat retarded, but, at the end of the fourth week, the results were the same as though no lime had been added.

Sal-ammoniac caused the most rapid deterioration of the iron; it was also most rapid in its action at the commencement, but it continued fairly energetic throughout the course of the experiment.

In solutions having an alkaline re-action, such as lime-water and soda-ley, the iron underwent not the slightest change; it was effectually preserved from rust. The addition of a little oil to the water notably decreased the amount of rust, which, at first, did not show at all, and afterwards only in smaller quantities. An iron pipe half filled with distilled water, and exposed to the air, was found to rust twice as fast as a similar pipe completely filled. This illustrates the injurious effects of interruptions in the service of a boiler. After having thus tested the effects of various salts on iron in the presence of atmospheric air, with and without an admixture of carbonic-acid gas, Professor Wagner wished to try the action of chlorine compounds on iron, exposed to heat, but carefully secluded from atmospheric action. The results were positive with the chloride of magnesia, and negative with the chlorides of soda, potash, barium, and lime.

The foregoing experiments,—those at ordinary temperatures, and at a temperature corresponding to the boiling-point of water, alike,—show that chlorine salts, such as the chlorides of magnesia, soda, potash, barium, and lime, and the hydrochlorate of ammonia, all exert an injurious action on iron if exposed to the action of the air. This consideration is of some importance in boilers. It is a question whether the addition of barium chloride to the feed-water is always beneficial in its results,—whether the elimination of the sulphate of lime thus effected is not counterbalanced by the production of some chlorine compound? In water containing much magnesia, such addition must prove detrimental by inducing the formation of chloride of magnesia.

Well or spring water, it has been seen, is less injurious to iron than pure water. This, probably, is due to the precipitation of carbonate of lime in the form of scale. From this point of view, a thin deposit of calcareous scale would appear advantageous, as protecting the iron from oxidation.

The use of sal-ammoniac as a "scale-preventive" should be invariably rejected, as in every case ammonical solutions are shown to have a very injurious effect on iron.

Professor Wagner's experiments show that the addition of oil or fatty matter has no injurious effect on iron, and that it prevents the formation of rust. The experiments were not, however, extended to temperatures in excess of 212° F., consequently there is nothing in them to prove that such additions may not act detrimentally at higher temperatures, as many authorities maintain. Substances having alkaline reactions,—such as lime and soda,—effectually prevent the oxidation of boiler-plates; they may therefore be safely recommended as "scale preventives," so long as they are added in suitable quantities, and not in excess.

DWELLINGS OF DANISH WORKPEOPLE

A Danish pamphleteer has compared the dwellings of the Copenhagen workpeople with those of operatives in the old town of Edinburgh. The Dane is lodged in the back part of a several storied house, generally in the so-called cellar, or half underground apartment, which may open into a dingy court 9 or 10 ft. square. There is little light or ventilation, and the people keep their apartments as close as possible; if willing to open their windows they can hardly do so for the effluvia from the latrines and open gutters in the court. The general and special smells of Copenhagen are hardly to be matched in any part of Europe. The average number of cubic feet of air to an individual is 213; in very many cases, however, the number is 45 cubic feet and less. It is not uncommon for two unmarried Danish workmen to take a furnished room between them. Such a room will cost four or five dollars a month, say 10s. A separate room for one man will be about 6s. 6d. a month. Married men take unfurnished lodgings, which consist of two rooms and a kitchen, costing about six dollars, or 13s. per month. The furniture and adjuncts are very often hired; are all of a rough description.

To meet the wants of the working classes, building societies have been started, which between 1851 and 1870 gave lodging room for about 3,200 persons in Copenhagen, in the form of 71 houses with 777 apartments. The most important of these societies was started by Messrs. Burmeister & Wain, the largest employers of labour in Denmark. The object they had in view was to introduce the cottage system, then almost unknown in the country. In its original shape the society was exclusively for the workmen in the firm's factory where about 800 were employed. A loan on mortgage was obtained from the Copenhagen Savings Bank, and a piece of ground was presented by a philanthropic manufacturer, M. Holmblad. The plan was that every member should pay one mark or 4½d. a week, and a deposit of one dollar or 2s. 2d. The houses when finished or unoccupied to be drawn for by lot; the member winning to pay a fair rent for the house; the excess of the rent over the interest (6 per cent.) on the actual cost of the house to be credited to the occupier who in twenty-eight years would thus repay the capital and be entitled to a conveyance of the house in freehold. The houses are two-floored; and if the tenant prefer to let the first floor, he would be able to work off his debt in ten years. Members who do not win are entitled to claim the entire amount of their deposits after eighteen years, and in certain other specified cases; temporary suspensions of the subscriptions for special reasons are allowed; members may cede their rights to other members, and so forth. The Society has now been thrown open to the operatives of the capital generally. It has built thirty-six two-floored cottages in rows, each having a small court and garden, and two or three rooms with a kitchen, being in all accommodation for 280 persons. The rent of a first-floor would be about 7*l.* 10s., of a ground-floor 6*l.* 10s. a year. This system offers great advantages to operatives, for at the worst they have invested their money in a savings bank; at the best their first rent-charge is only 6*l.* or 7*l.* a year, whereas their less fortunate fellows must pay at least 8*l.* a year for much worse accommodation on a flat. Of the other enterprises of a like kind four have been set on foot by share companies; with three of these are associated baths and wash-houses. All these companies have been founded by the philanthropic efforts of capitalists, professional persons, and others, the operatives having, as a rule, hung back until the general arrangements were made. Everything, indeed, it is said, has been done for the working classes, nothing by them.

In the direction of co-operative stores great efforts have been made to benefit the workpeople. There are now in Denwark 37 stores on the Rochdale model. The Rev. Mr. Sonne, of Thisted, has the credit of having been the founder of the first Danish store, and the Government has acknowledged his zeal by decorating him with the order of the Dannebrog. He is, however, so far removed from the good graces of the trading classes as to be spoken of as a malignant incendiary. Mr. Sonne began operations by inducing 83 operatives to subscribe 3d. a week each to a share fund, of which he undertook the management. His next move was to contract with a baker, who, upon being guaranteed the custom of the Society, allowed the members large discount on all purchases of bread. The discount was saved up until after four months' delay it amounted to 6*l.*, when the society ventured to lease a house, and to begin buying on its own account. As definitely organised, the society consisted of shareholders, with five shares at 11s. to be paid up in weekly instalments of 3d.; entrance fee 1d.: election by ballot; sales at current prices. After a quarter's business the Thisted store was able to pay 5 per cent. on capital, and to allow purchasers 2d. discount on the Danish dollar (2s. 2d.).

Danish wages are somewhat higher than what were paid a quarter of a century ago, especially for unskilled work. But the rise has not kept pace with the increased price of food and lodging (from 30 to 40 per cent. since 1850), so that the improvement in the artisan's condition has lagged behind that of the country at large. The labour market is generally glutted, partly, no doubt, owing to the constant influx of Swedish, and even of German artisans. The Swedish mechanic or field labourer can travel to Denmark for 2s. or 3s., he gets higher wages than at home, and can adapt himself at once to the local habits which, in fact, like the language, are nearly identical

with his own. The average earnings of good hands are:—for bricklayers, carpenters, paviours, 15s. 6d. to 17s. 6d. per week; smiths, 20s.; tailors, 15s. 6d.; shoemakers, 13s.; weavers, 22s.; painters, 17s. 6d.; helps, and all kinds of unclassified daily workmen, 8s. to 10s. 6d. The earnings, however, of some of the workmen are subject to great fluctuations, according to the season. In the months of May, September, or October, a first-rate carpenter might contrive to earn 26s. a week, and first-rate bricklayers 30s. Tailors may, at times, earn 22s.; shoemakers up to 17s. 6d.; smiths up to 26s.; all must be first-rate hands by piece-work, and for Copenhagen only. All things considered, where the English operative is earning 20s. a week, the Dane may be getting 13s., the English 36s. wage answering to 19s. or 20s. in Copenhagen. Provincial rates are somewhat lower than those in the capital, and the workman is, on the whole, not so well off. The provincial artisan not unfrequently lives with his master; a carpenter would, under this system, receive 9s. a week with board and lodging. The village artisans are generally agriculturists, with three or four acres of ground, leasehold or freehold.

Danish victuals are inferior to English victuals. First-rate meat cannot be procured in Copenhagen at any price. Rye bread is universally eaten, and it seems to be an unobjectionable kind of food, most Englishmen, prejudice apart, would prefer it to town-bakers' bread. Danish cookery is inferior and wasteful. The workmen's wives are not good economists, they generally buy at the worst shops, purchasing very small quantities at a time, such as a ¼ lb. of butter, a pennyworth of potatoes, and so forth. The operative's indispensable clothing costs him from 3*l.* to 4*l.* a year. When he has the means he is not satisfied with making a respectable appearance suitable to his position, but is anxious to dress so as to pass for a man of independent income on Sundays and holidays.

HYDE PARK CORNER.

"Something must be done," no doubt, before next season, to relieve the pressure of traffic at Hyde Park corner and Grosvenor-place. Although, as Mr. Sidney Smith would have said, we may not yet have heard of a Bishop being killed there, not only the episcopal bench but all other classes of her Majesty's subjects are in danger of such a catastrophe.

"Something must be done!" Quite true. But, by all means, let the "right thing" be done. It is a matter for congratulation that, even at the last hour, the Government scheme is not to be carried out "without the most careful consideration." This was the effect of Lord Henry Lennox's reply to Mr. Adam in the House of Commons the other night.

The Government scheme is,—to form a sunken road, or what, in railway phraseology, would be termed an open cutting, from a point opposite to Hamilton-place, across the Green Park, passing under Constitution-hill (which is to be raised to allow of the subway) and running into Grosvenor-place, at an ugly angle not even opposite to Halkin-street, but some yards above it. Very unwillingly we are obliged to say we do not like the scheme. The arrangement would not only be unsightly, but the open cutting would effectually cut up a pretty and much used part of the Green Park, and would leave the useless corner of the park, close to the reservoir, in its present ugliness. It would also make irremediable the dangerously narrow neck of Grosvenor-place; for, if Constitution-hill is to be heightened, Grosvenor-place can never be widened. The subway would also, we fear, involve nuisances of many kinds.

The Duke of Westminster's counter scheme of forming a broad descent from Piccadilly down to Grosvenor-place by throwing open ground on the east side of the arch, leaving that erection in the middle of the roadway, seems to us far more promising. Besides the immense public convenience which would be secured, the architectural effect of this scheme would be grand; and if, in connexion with it, the ugly wall of the Queen's garden, which bounds the eastern side of Grosvenor-place, could be replaced by a handsome wall, or by pretty railings worthy of the locality, with a bank inside, an urgently demanded public improvement would be carried out. London is greatly indebted to the Duke of Westminster for improvements which his Grace has carried out; and, on this ground alone, any improvement proposed by him is entitled to special consideration. The Duke has offered to contribute 3,000*l.* towards the widening of the neck of Grosvenor-place, and, no doubt, he and his tenants in Grosvenor-place would also contribute largely towards the improvement of the wall lower down in Grosvenor-place. At all events, it will be inexcusable if the Duke's project, backed up as it is by a handsome contribution, do not receive the most careful consideration from instructed and competent persons. By an alteration of the gradient, the road of Constitution-hill might still pass under the arch, for State purposes, if desired; and a road could be carried, on the level and not through a cutting, from opposite to Hamilton-place across the Green Park to Grosvenor-place.

We cannot resist a strong conviction that the sub-way as proposed would be a mistake, and one of no ordinary bigness.

THE PHAROS AT DOVER, AND THE REMAINS ON THE WESTERN HEIGHTS.

The following is the communication addressed by Mr. C. Roach Smith to Mr. Mackeson, the mayor of Hythe, and read by the latter at the recent joint meeting there of the Royal Archæological Institute and the Kent Archæological Society:—

In forwarding you Lieutenant (now Captain) Peek's plan of the Pharos, I may as well extract what Stukeley, in his Itinerary (1722) says about it. He was a good draughtsman; and in such matters may be relied on for accuracy. It is only in some of his theories he is not always to be relied upon.

"One part of the fortifications consists of a large circular work, in which stands the old church. There is not much doubt to be made that upon this hill was a *castrum* of the Romans, like that at Richborough, to guard this haven. The church was built in the first times of Christianity, out of part of the Roman ruins, whence there are huge quantities of Roman bricks laid into the work; the arches are entirely turned with them; the corners and many parts, both within and without, are built up therewith; and the remainder is of stone, originally cut by the Romans. But the greatest curiosity here is the *Pharos*, or Roman watch-tower, standing at the west end of the church. Notwithstanding it is so much disfigured by new daubing with mortar, casing, and mending, I discovered its primary intention the first minute I saw it; and sent the three prints of it, which I here present the reader, to Monsieur Montfaucon, at the instances of my most honoured lord, the Archbishop of Canterbury. I was in hope they would have been more useful to that celebrated author; for therein, at least, he might have found that the building which he first took for a *Pharos*, and whereof he gives us four views, is truly the tower of the church we were talking of. The description of this curious work, which I believe the most perfect of any left, in short is thus."

"In the forty-seventh plate we have shown the ground-plot upon which it is formed, and a section of the work, whence we may readily observe that the design is simple, but admirably contrived for its use and purpose; the base is octagonal without; within, a square; but the sides of the square and octagon are equal; viz., 15 Roman feet, which reduces the wall to the thickness of 10 feet. In this manner it was carried up to the top, which was much higher than at present; but it retires inward continually from all sides, with much the same proportion as an Egyptian *obelus*.* Upon four of these sides there are windows narrow, handsomely turned with a semicircular arch of Roman brick, 6 ft. high, so that the outside of it appears as in our forty-sixth plate.† The door to it is on the east side, about 6 ft. wide, very well turned overhead, with an arch made of a course of Roman brick and stone alternately, 14 ft. high. All the stones of this work are of a narrow scantling; and the manner of the composure, throughout, is perfectly the same as that lately described at Richborough Castle; there are, first, two courses of this brick, which is level with the bottom of the windows; then seven courses of hewn stone, which mount up to the top of the windows; then two courses of brick, seven of stone, alternately, to the top; every window by this means reaching to a stage or story. There are five of these stages left; the windows are visible enough to a discerning eye, though some be stopped up, others covered over, others have modern church-like windows of stone put in. I suppose the inside was entirely filled up with a staircase; the height of what is left is 40 ft. I believe there were 20 ft. more originally; and the whole number of windows on a side was eight. This building was made use of as a steeple; and had a pleasant ring of bells in it, which Sir George Rook procured to be carried away to Portsmouth. Since then the office of the Ordnance, under pretext of savingness, have taken away the lead that covered it and left this rare piece of art and masonry to struggle with the sea, air, and weather. Mr. Dezg gave me a coin of Diocletian, found here. The Erpinghams' arms are patched up against one side of the Pharos, being two bars and a canton, so that I suppose it was repaired in Henry V.'s time, Lord Erpingham then warden of Dover Castle. I have heard there is another such Pharos at St. Andrews, in Scotland. Such a Roman *Pharos* is at Damiata, in Egypt, the view of it in 'Le Brun,' plate 70, letter A."

"On the other high cliff, opposite to this, beyond the town, has been another *Pharos*; some part of the bottom part of it is still left, called the Devil's Drop, from the strength of the mortar: others call it Bredonstone. Here the new constable of the castle is sworn."

"Upon another rock over against this, and almost of equal height, there are the remains of some very ancient building. One author, upon what grounds I know not, has called it 'Cæsar's Altar'; but John Twine, of Canterbury, a learned old man, who in his youth had seen it almost entire, affirmed to me that it was a watch-tower to direct sailors by night-lights (some part whereof is yet remaining, called Bredenstone). Such another there was over against it at Bologne in France," &c. (Gibson's "Camden," p. 250).

Thus far Stukeley. The "circular work" he speaks of is indicated in a plate by a turret; and the core of the wall (for such it must have been) is in part yet to be seen. But whether this was Roman work is a question easily solved by spade and pickaxe, the only interpreters we can appeal to with confidence in such cases. If there be such a Pharos at St. Andrews, in Scotland, it stands a reproach to the archæologists of the last century and a half that they have had so little enterprise as to allow it to remain undescribed. And another on the coast of Flintshire, recorded by Pennant, and engraved for an article by the late James Yate, M.A., for Dr. Smith's "Dictionary of Greek and Roman Antiquities," also of questionable origin, remains unchallenged. The appearance of the latter, as shown by the woodcut, begets mistrust; but it is remarkable that up to the present day we have no decided authority as to whether they are ancient or Mediæval. The name *Bredan*, I suppose, merely refers to the size of the stone, which if it be Roman masonry, would readily respond to a slight excavation, and reveal its real character and origin.

Although part of the Pharos may have gone to help build the church it is obvious that the great mass of Roman materials employed was taken from other buildings. There is yet to be seen to the N.E. of the Pharos, and close to the church, a large block of Roman masonry, which must, from its size and weight, be in its original site though overturned, apparently from undermining. To this I call your attention, and to the ramparts.

A few years ago a Colonel in command of the Royal Engineers, with happy inspiration, resolved to clear the Pharos of the surrounding accumulation of earth, the modern insertions of brickwork, to open the entrance, and to remove the modern wall connecting it with the church. This was done, mainly under the superintendence of Lieut. Peek, to whom we are indebted for the plan, and for the accompanying notes. He remarks:—"The removal of the masonry from the upper window on the south side has disclosed the Roman work in a perfect state. It presents two features of interest: one, a low, dwarf, parapet wall of Roman tile across the external opening as if for the security of a watchman observing the French coast, of which no traces are to be found in the other windows; and is also remarkable for the manner in which the reveals of the window are stopped short of the external face, an impediment which may perhaps have been adopted to hide the awkward effect produced if the external face were carried up in one uniform instead of perpendicular. As far as the different stories were concerned, I found an opinion rife that the original building had been square; and that its present octagonal

* *Obeliscus.*

† Are there windows on four sides? I think not. They cannot be properly termed *narrow*.—C. R. S.

form was due to the action of time in rounding off the corners, and to the improvement effected by the Mediæval restorer; but on digging down in one of the inner sides, the edges of the courses of Roman tile in a set-off of the foundations following the lines of the octagon disproved the supposition."*

"As far as I can judge, the original tower consisted of five stories, lighted on each of the cardinal sides by windows 2 ft. wide, except on the upper floor, where the width was increased to 4 ft.; and the ground floor, where an opening to the south, 4 ft. wide, served as a doorway. The south side differed from the others in having no windows on the alternate floors; and an increase of width to 3 ft. given to the middle window. A prominence is thus given to the south side, which may have some connexion with the fact that it looks directly on Cape Griznez, the nearest point of France, if we suppose the use of the building as a watch-tower to have been intended in the original design. Particularly as the east and west sides are thus directly facing the two adjoining military stations, Richborough and Hythe (Lymne), which, though not directly in view, could, no doubt, give a signal by a beacon fire of any approaching enemy."

"The material used throughout is tufa, exactly similar to that found in the valley below, near Buckland, banded together by courses of tile every 4 ft.; and with a view, as I suppose, of drying the great mass of masonry, perforated by air-holes from inside to outside, at irregular intervals."

"The Mediæval reconstruction consisted in covering over the lines of the Roman Pharos with a casing of stone and squared flints, and blocking up the windows so as to form a dark tower, divided into two stories, which, from its doorway facing the west door of the church, may have been applied to the purposes of a crypt, or as a temporary resting-place for the bodies of persons to be buried in the graveyard adjoining. Above this, a light ornamental belfry was added. The sudden decrease in size at the bottom of the superstructure is probably the result of the upper portion of the Roman work having suffered from time, and being unfit to bear the additional weight, and having been, therefore, trimmed.—Yours very truly,

(Signed) W. Emerson Peek.

February 2nd, 1872.

To C. Roach Smith, esq."

We must all be deeply obliged to Captain Peek for the perseverance and skill he has shown, and for communicating the result so good-naturedly. I have only, in addition, to draw your attention to the very superior manufacture of the tiles. They are of very unusual size, and of superior workmanship, where all is good. In the Dover Museum is a perfect specimen, asserted to have come from the Pharos (if I mistake not), I have also figured one in my "Richborough, Reculver, and Lymne," copied from a plate in the "Archæologia," vol. v., for the sake of an inscription. No doubt the four circles upon it are projections, as in that in the Museum, reversed by error of the original artist. The tiles in the Pharos do not appear to be stamped. That referred to was from a building in Dover, probably of later date. This stamp of the makers, CL.BR., which is the only inscription found at Dover, occurred rather frequently upon the tiles found at Lymne. It refers to the British *Classiarii*, or Marines, whom we also find, at some unknown period, in the North of Britain (see Dr. Bruce's "Lapidarium Septentriale," p. 199).

As Montfaucon and the Pharos at Boulogne have been referred to above, it may be in place here to insert a note I made some time since.

The Pharos at Boulogne is described pretty fully by Bernard de Montfaucon in the "Mémoires de Littérature tirés des Registres de l'Académie Royale des Inscriptions et Belles Lettres" (1718 to 1725). Amsterdam, 8vo., 1731, tom. ix., p. 278. It was octagonal. Each side was, according to Bucherius, 24 ft. to 25 ft.,—its circuit therefore, 200 ft., and diameter, 66 ft. It had twelve entablatures, or kind of galleries, as is seen from without, not comprising the basement, concealed by the small fort built by the English, in 1545, around it. Each entablature formed by the thickness of the wall below was a sort of small gallery, of 1 ft. 6 in. wide. Thus this Pharos, like others, diminished in its stages. It was called *Turris ordens*, or *Turris ordensis*, probably from *Turris ardens*. The people of Boulogne called it *La Tour d'Ordre*. Eginard says that Charlemagne (A.D. 811) restored it, and placed a night-light upon its summit, as a guide for ships. Being undermined for stone, both the Pharos and the fort fell on the 29th of July, 1644.

C. Roach Smith.

* The octagon was a favourite form of the Romans, and occurs very frequently in buildings, in sculpture, and in ornamental designs, especially in the tesselated pavements. The Pharos at Boulogne was octagonal.—C. R. S.

CRYSTAL PALACE SCHOOL OF ENGINEERING.

The summer term of this school was brought to a close on Saturday last, when, as usual, a number of the friends of the students and others interested in the school were invited to an inspection of the students' work, in the drawing-office and the different workshops, and to witness the presentation of the certificates awarded by the examiners, who, on this occasion, were Messrs Richard Hassard, C.E., and William Jacomb, C.E. Colonel C. Brisbane Ewart, C.B., R.E., presided at the closing meeting, and presented the certificates awarded to the students.

The first term of the three into which the year is divided is spent by the students in the drawing-office, in which a large number of drawings were shown, some of them of a high degree of excellence. The subjects relate to mechanical and civil engineering, including structures of various kinds. On entering the drawing-office the attention of the freshman is directed to some such document as the following imaginary "order":—

"Please design for me a queen-post roof, of 40 ft. span, the principals of which are to be 6 ft. apart from centre to centre. The angle of the roof is to be 30°, and the rise of the tie-rod in centre 2 ft. The covering is to be slate, on ¾-in. boarding; and there are to be two purlines of deal on each side, resting on the struts. The principal rafters are to be of T-iron, as also the struts. The general rafters are to be of wood, placed 1 ft. apart from centre to centre. The elevation of the principal is to be to a small scale, and details are to be shown of the connexions of all the parts."

Similar "orders" are given to the students for horizontal expansion engines, strong double-purchase crabs, hollow plunger pumps, and other objects within the domain of mechanical engineering. The students' replies are given by the production of the required drawings, accompanied by specifications and detailed estimates. The next term is spent by the student in the pattern-shop and foundry. The patterns exhibited were of a very miscellaneous character, some of them being for the trade. Many of them were beautifully made, and seemed likely to "draw" well. The third term is devoted to the fitting and smith's shop. In the fitting-shop the effective machine tools of the school were shown at work, driven by a horizontal engine of three horse-power, nominal, made by the students. Since the opening of the school, at the beginning of 1873, six of these engines have been made by the students. During last term they have made one engine and part of another. The civil engineering course requires attendance for two additional terms.

After the inspection the company assembled in the lecture-theatre of the school, Col. Ewart presiding. Mr. F. K. J. Shenton read the examiner's report. Thirty-one of the students were eligible to go in for examination upon the subject of "Railways: their Construction and Appliances." Of these twenty-six passed and received certificates, all but one of the number receiving a second certificate for merit in the particular department of the course he had been passing through during the term. The highest number of marks attainable for the "Railways" examination is 232. Mr. A. Brook was first with 201 marks, and had also a certificate for fitting; A. Marshall was second with 200 marks. The remaining twenty-four students were placed as follows, omitting the numbers of their marks:—H. E. Read, and second for drawing; C. B. Penlington, and for drawing; W. J. Bean, and for fitting; E. A. Thomson, and second for fitting; S. Firth, and for patterns; R. Moyes, and for patterns; H. Gay, and first for drawing; J. Mayhew, and second for patterns; W. B. Dutton, and for fitting; J. Suart, and for patterns; E. A. Brine, and first for fitting; F. S. Richardson, and first for patterns; L. Ewing, and for drawing; A. W. Payne-Gallwey, and for drawing; H. le G. Solly, and for drawing; A. H. Adams, and for fitting; A. W. N. Lewis, and for Civil Engineering, first term; H. Fenhoulet, and for drawing; J. H. Preston, and for fitting; F. A. Wythes, and for fitting; W. H. Payne-Gallwey, and for drawing; H. S. Vogan, and for patterns; H. Field, and for drawing; and P. W. Foster, "Railways" Examination, and for patterns. Thirteen certificates were awarded for drawing. In addition to the students named in the above group, certificates were awarded to J. E. Corker, A. G. Hudson, S. Hewitt, and E. H. Wallick. The following were, in addition to the students already named, included in the eleven to whom certificates were awarded for work in the pattern-shop and foundry:—P. Baylis, A. Emery, E. Wilson, and H. Barnett. For work in the fitting and smith's shop, certificates were awarded to ten students, including, in addition to those already named, S. P. Sheraton, and T. S. Tilley. In the Civil Engineering section, first term, the following certificates were awarded for general surveying, and the preparation of plans and sections for Parliamentary deposit:—H. J. Saunders, F. Fitzherbert, G. E. Bokenham, H. Edwards, and A. W. N. Lewis. For the same section, second term, for calculation of strains, and the preparation of general and working plans, specifications, and estimates of a railway and dock, the following certificates were awarded:—M. Harding and G. Marston, equal firsts; W. H. Fisher, and A. H. Wilson, second and third respectively. The Examiners conclude their report by saying:—"We have much pleasure in stating that the general proficiency of the students is evidence of the practical value of the course they are passing through, which should fit them for commencing their duties, in the several branches of civil and mechanical engineering; we further express our satisfaction in the general training of the students, which reflects great credit on your able principal, Mr. J. W. Wilson."

After presenting the certificates, Colonel Ewart addressed the company congratulating the directors on the prosperity of this most useful school, that was just what was wanted to equip young men for entering upon the professions of civil or mechanical engineer.

Mr. J. W. Wilson, the principal, in replying to a vote of thanks, said he felt personally grateful to the examiners for the time and attention they had bestowed. Mr. Hassard had been at the trouble to work out all the questions for himself; that made the awards of so much higher value. He spoke in terms of special approbation of several of the students; amongst others, "young Vogan," who had been awarded two certificates, and who was so short as to have to stand upon a box to enable him to work at the bench. Mr. Wilson gave some interesting particulars as to the positions and occupations of some former pupils of the school.

THE INHABITED HOUSE DUTY AND POOR RATE.

WHAT CONSTITUTES A "HOUSE"?

The Court of Exchequer has just ruled that it is legal to charge house-duty and poor-rate on the same house on two distinct systems. The question came before the Court in the case of "The Attorney General *v.* The Westminster Chambers Mutual Tontine Association." The Association own the "Westminster Chambers" in Victoria-street, Westminster, a row of seven blocks of buildings, having seven principal entrances. Each of these blocks is divided into two ranges by an internal staircase, which has only one door at the principal or street entrance, and each block is in its internal arrangements structurally divided into different tenements or suites of rooms, which are quite distinct from each other, like chambers in the Inns of Court, and they are let and occupied separately as chambers, offices, or residences. Each tenement or suite of rooms has an open door opening on to a staircase common to all, and also an inner private hall or passage, a water-closet, and a lavatory. There are no means of communication between those tenements or suites of rooms other than the staircase common to all. Nearly all the tenements or suites of rooms are let and used as offices or chambers for business purposes, and they are locked and unoccupied during the night. A few only of the tenements or suites of rooms in three of the blocks are used as residences.

The outer or street door to each block of building is kept locked at night, and a porter, who is appointed by the Association, resides in a distinct set of rooms in the basement of each block of building, and has a key of and access to the suites or sets of rooms in such building in the occupation of the tenants as their servant.

The Association provide gas for the staircases, halls, and passages, and water for the entire buildings, and pay all rents and taxes in respect thereof, charging their tenants higher rents in consequence.

Power is given to the defendants to demise or sell any set of apartments separately from the rest of the house. None of the suites of rooms have been sold, but the greater number have been demised for seven, fourteen, or twenty-one years.

Each block is not inserted in the valuation list prepared under 32 and 33 Vic., c. 67, as one hereditament; but each of the 117 tenements or suites of rooms of which the seven blocks consist is treated as a separate hereditament and assessed accordingly, the name of the tenant of each such tenement or suite being inserted as the occupier and separately assessed to the poor-rate. It has already been held, by the decision of the Court of Queen's Bench, that each tenement or suite was, for the purposes of a poor-rate, a separate rateable hereditament. Many of the 117 tenements or suites are unlet, and some never have been let, and therefore the defendants derive no rent therefrom. The Crown contended (1) that for the purpose of inhabited house duty the property should be assessed as several dwelling-houses only on the defendants as occupiers under 48 Geo. III, c. 55, schedule B, rule 6; and (2) that the value of each of the seven blocks was properly represented by the aggregate sum of the values which appear in the valuation list as those of the separate hereditaments occupied by the defendants' tenants.

The defendants contended (1) that each of the 117 tenements or suites should be separately assessed on the tenants under rule 14 of the above-mentioned schedule; and (2) that, if the Crown was right on the first point, then, since many of the tenements were unlet, and the values in the valuation list did not represent the annual value of the blocks to the defendants, the Crown ought to make a separate valuation on the defendants of each block under 32 and 33 Vic., c. 67, section 76.

The majority of the court, viz., Barons Bramwell and Clessby, held that the Crown was right on both points; Chief Baron Kelly, however, held that the defendants were right on the first point.

The result of this decision is that each suite of rooms may be assessed for poor-rate separately, while each block of buildings, whatever the number of separate suites, is to be charged house-duty on the total value of the various suites.

INNER CIRCLE COMPLETION.

A "LITTLE BILL," passed in the expiring session' gives powers to the Metropolitan District Railway Company to make a short junction line at Hammersmith, which will connect the Midland and the South-Western Companies' lines with the District system, and give them access to the Mansion-house Station. This station, because of its being a "dead end," is already subjected to a crowded traffic, greater than it can well bear, an inconvenience that would be completely obviated by the completion of the inner circle, and the Mansion House being made a way-side station.

There can be little doubt that this short, inexpensive link at Hammersmith will be constructed at once, inasmuch as a few months, six at most, will suffice to make it. Its making, and the demonstration it would be, of important traffic advantages that it would place within the reach of the Midland and South-Western Companies, always provided that the circuit is completed, should make those companies the allies of the Metropolitan Railway Inner Circle Completion Company.

The Midland, by the completion of this link at Hammersmith, and the filling up of the gap between the Mansion House Station and the Liverpool-street Station of the Metropolitan line, would have a London circuit communication. The South-Western, at present almost shut out from the North side of the Thames, and from the City, excepting by transfer to the South-Eastern Company at Waterloo Junction, would then have independent access to the City, and to the Great Eastern, King's-cross, and St. Pancras Stations.

It is also interesting to notice that the making of the short Hammersmith link and the completion of the inner circle would provide the outer circle of railway communication round London recommended many years ago by a joint committee of Lords and Commons. This outer circle would touch, or pass quite close to, the following among many other important points:—Victoria Station, Westminster Bridge, Charing-cross Station, the Temple, Blackfriars Bridge, Mansion House Station, Cannon-street Station, Eastcheap, Fenchurch-street Station, Aldgate, and then, turning to the north and west, the stations of the East London, communicating with the Brighton and South Eastern systems, the stations of the Great Eastern, North London, and London and North Western in Liverpool-street and Broad-street; thence, northwards, to King's-cross and St. Pancras Stations, Camden-road, and Kentish Town, Haverstock-hill, Finchley-road, Cricklewood, Harrow-road, Willesden Junction, Acton, Hammersmith, and on to the starting point at Victoria Station. It may be readily apprehended that a completed railway communication connecting such important points with each other would be a great public convenience, that those who travel most will be the readiest to appreciate. The advantages, however, that seem so nearly within reach are contingent upon the execution of the short link of the Metropolitan District line at Hammersmith, which that company will doubtless make at once, as an important feeder to its traffic from the west. An essential and more important requirement is the completion of the inner circle by a junction of the Metropolitan and District lines at their present eastern termini.

The Metropolitan Company, it appears, intend to continue their line to a terminal station at High-street, Aldgate, that will be a spur from the inner circle completion line. Whether this extension will prove remunerative, if constructed, remains to be ascertained, but it would seem, to say the least, open to doubt.

THE CHAMPION ROCK BORER.

It may interest your readers to have some statistical information about this compact and well-arranged rock-borer, which is the property of Messrs. Ullathorne & Co. A thoroughly good rock borer is one of the most important mechanical contrivances which can be conceived, and it has so many requirements that it is very difficult to meet them all, but I must say that I was very much pleased with what I saw, during the crucial trial of this little apparatus, which I had the pleasure of witnessing a few days ago.

The No. 2 size Champion Rock-borer, which I saw in action, weighs 1 cwt. 3 qrs., and is connected with a telescopic tripod weighing 3 qrs., so that it is very portable, stands steadily upon any uneven surface, and will work with equal facility in any position, vertical or horizontal. The drill or chisel used was a round steel bar, flattened at the lower end and brought to a V-edge. The drill is made fast to the reciprocating piston-rod of the apparatus by means of an ingenious expanding clip, which ensures the whole being concentric and firm. The piston is packed with Ramsbottom's steel rings. The motive power is either steam or compressed air, and is admitted under the piston, so as to raise it the required height, and is then transferred to the other side so as to cushion the blow and overcome the inertia when the stroke is made. The drill and piston are rotated slightly during the upper stroke, so that the nose of the tool drops in a different position each time, and it is so arranged that in case of an obstacle occurring so as to prevent this motion, a friction clip secures the apparatus the danger of breaking. The feed of the drill is regulated by an ingenious automatic action, which only works in proportion as the drill enters the material upon which it is acting. It works on the upward stroke only, and is so arranged that if neglected, and the screw becomes jammed, a friction bar will rotate, and thus a breakage be avoided. The valves of this apparatus are cylindrical, and partially rotate, the motion being imparted by a rocking saddle, actuated by a stud from the lower part of the machine; an external stud enables these valves to be moved by hand, so that the cylinder can be cleared of water at starting.

During the experiments which I made with this apparatus upon a very hard piece of Guernsey granite, I obtained the following results:—the diameter of the drill used was a little under 2 in. and made a 2-in. hole. The piston reciprocated with from 600 to 800 strokes per minute, and had at the back of it 45 lb. of steam, and in three minutes the distance the drill entered the granite was 12 in. The tool had a fair edge at starting, but was quite round and blunt when the hole was complete; this did not, however, seem to interfere with the effect produced, which I believe was entirely due to the concussion and rotation. When this experiment was completed a smaller drill, 1½ in. was introduced, and this entered the granite 13 in. in two minutes and a half.

If I am not mistaken, we shall hear more of this little rock-borer; there is that about it which gives the impression that it is meant for work, and is what is called a likely tool; anyhow, it is well worthy of the consideration of engineers and contractors who are engaged in driving headings, making tunnels, or blasting.

J. W. Wilson,
Principal of the School of Practical Engineering, Crystal Palace.

THE PROPOSED SANITARY AND EDUCATIONAL EXHIBITION AT BRIGHTON.

In connexion with the Social Science Congress, to be held at Brighton, from the 6th to the 16th of October next, it is intended to form, as on some previous occasions, an Exhibition of Sanitary, Educational, and Domestic Appliances. It will be set up in the Corn Exchange, adjoining the Dome of the Pavilion, Brighton.

The object of the Exhibition, as heretofore, is to bring under the notice of the public generally, and particularly those who are interested in the social, sanitary, educational, and economical questions, the latest scientific appliances for improving the public health, promoting education, and advancing social economy. These will be classified under the following heads, viz.:—

1. *Warming, Ventilation, and Lighting*, which will comprise registers, grates, stoves, valves, flues, furnaces, boilers, fuel economisers, steam warmers, hot air and water systems of warming, means of ventilation, regulators for preventing smoke and waste, air reservoirs, gas reservoirs and apparatus; lighting by candles, gas, oils, mineral oils, lamps, lanterns, lamp pillars, gaseliers, jets, reflectors, conductors, with drawings and plans, &c.

2. *Domestic Appliances and Economic Apparatus*, to consist of stoves, ranges, kitcheners, and ovens (heated with gas or otherwise) for roasting, baking, or boiling, &c.; natural and artificial fuel, economisers of fuel, food manufacturing machines, laundry machines and cleansing implements, household ware, culinary utensils, sewing machines, and articles of domestic utility and household economy; means of preventing injuries and diseases which specially attach to industrial occupations.

3. *Sanitary Architecture and Appliances*, for outward and interior ornamentation, including cisterns, lavatories, baths, closets, filters, fountains, indicators, paving and roofing materials, ornamental bricks and tiles, garden ornaments, terra-cotta, selenitic compounds, cements, plaster, concretes, slag, stoneware and clayware, building materials, models of dwelling-houses, cottages for the poor, &c.

4. *Sanitary Engineering and Methods of Disinfecting.*—All things connected with the supply of water, sewerage, drain pipes, tubes, valves, sinks, taps, traps, troughs, closets, commodes, urinals, filters, water-waste preventers, sewage and drainage contrivances, disinfecting apparatus, deodorants, antiseptics, &c.

5. *Food and Clothing.*—Specimens of food and confectionary, food for adults and children, conservation of food, condensed fluids, preserved meats, fruits, vegetables, and other articles of general consumption; beverages, analyses, and specimens of adulteration in various forms; articles of dress and clothing best adapted for men, women, and children, in all weathers; sanitary cloths, felts, waterproofs, India-rubber goods, and hygiene in clothing generally; beds and bedding for hospitals and tents, and appliances for the sick chamber and for the comfort of invalids; life-buoys, swimming-belts, and fittings for protection of life from drowning, and means for the prevention of accidents from fire, water, and other causes.

6. *School Furniture and Educational Apparatus*, comprising models and plans of school buildings; school desks and furniture, instructive toys, gymnastics, maps, drawings, books, stationery, prints, figures, and other articles used in teaching; school clocks and decorations.

The exhibition will be opened with an address, to be delivered in the dome, to which the public will be admitted free; and lectures on the various classes of exhibits are being arranged for.

The regulations and any desired information may be obtained from Mr. James Robinson, of 1, Adam-street, Adelphi.

We cordially invite our readers, whether for their own sake as manufacturers of such appliances or as desirous of the general good, to see in what way they can best aid in rendering this exhibition valuable.

New Law Courts for Liverpool.—A communication from the First Commissioner of Works was read on the 4th inst. before the Liverpool Town Council stating that so soon as the estimates for the next financial year were brought forward, the Board of Works would consider the erection of the proposed new Law Courts at Liverpool. The site chosen is that at present occupied by the Victoria Hall, where the Moody and Sankey services were held.

CONCRETE SLAB COTTAGES.

The economical construction of cottage dwellings is a subject which has of late years received a great deal of attention, but it must be admitted that the practical results hitherto attained have not been sufficient to satisfy either the philanthropist or the capitalist. It is essential to a successful solution of this question that a labourer's or artisan's cottage should fulfill the following conditions, viz.:—1. It should contain the requisite accommodation for a man and his wife with a family of say four or six children, separate sleeping-apartments being provided for the boys and girls. 2. The cost of construction should be so moderate as to admit of the cottage being let at such a rent as can be conveniently paid by the tenant, and yet yield a fair return for the outlay. 3. The mode of construction should be such as to avoid the necessity of frequent repairs. To these three principal requirements others of minor importance may be added, such as facility of construction without the aid of skilled labour, and also that the external appearance of the structure should be such as to please the eye without necessarily involving any great cost for ornamentation. It has been abundantly proved that proper accommodation for a labourer and his family cannot be provided at a suitable rent in cottages constructed in the ordinary manner, and of the materials usually provided for the purpose. 250*l.* appears to be the ordinary estimate for a pair of brick-and-timber-built cottages, with slated or tiled roofs, and although this sum may be considered a moderate price for the work done, there can be no doubt that it is in excess of what can usually be afforded for the purpose. When from the probable rent to be obtained are to be deducted rates and taxes and the cost of repairs, it will be evident that cottage-building, under such conditions, is not likely to become a very attractive investment.

The construction of the walls of cottages in concrete instead of brick has of late somewhat reduced their cost, but the use of this material involves the construction or purchase of a somewhat costly apparatus, and the walls, when erected, must be stuccoed, thereby requiring the aid of a skilled artisan.

By a plan recently invented and patented by Mr. W. H. Lascelles, of Bunhill-road, London, he professes to be able to dispense almost entirely with skilled labour; the assistance of a carpenter only being required to set up the skeleton framing of the structure. The framework of the building is constructed of wood much in the same way as the framework of a timber-built or lath-and-plaster house, except that the vertical standards or quarterings are about 3 ft. apart, instead of 1 ft. 6 in. or less, as is usually the case in wooden houses. The walls are constructed of concrete slabs about 1½ in. thick, made of fine ashes, or breeze, or crushed coke, with a proper proportion of Portland cement. The slabs are made about 3 ft. long by 2 ft. wide, and are cast in moulds, iron rods being embedded in the concrete, to strengthen the slabs, which are faced on both sides so as to require no further finishing. The face of the mould may be so prepared that the outer face of the slab would look like wall tiling, and a suitable colour may be added to the concrete to assist in giving this appearance should it be desired. The slabs are rebated at their sides and ends so as to fit into each other, and they are fixed to the uprights of the wooden framing by means of screws, the joints being made tight with cement. The inner partition walls are made of the same kind of concrete slabs, finished smooth on both sides. The ceilings and floors are also made of the same kind of slabs, but finished smooth on one side only. The roof is constructed of similar concrete slabs. The slabs may be easily cut with a saw, so that they may be used to form the chimneys, which are pargetted on the inside.

The patentee claims that this mode of constructing cottages possesses many advantages, not the least of which is that a dwelling of neat and even ornamental appearance may be constructed at a cost much less than one built of brick in the plainest manner, as there is a great saving in the weight of material used, the mere carriage of which is an important item in some places. Another advantage is that increased space is obtained both in walls and in roof, and cleanliness is insured, as there will be no hollow spaces to harbour vermin. Dispensing in a great measure with skilled labour is also an important point; as one artisan to prepare and set up the wooden framework is the only skilled man that will be required; mixing the concrete, filling the moulds to form the slabs, and screwing the slabs to the wooden framework being simply labourers' work, in which they soon become expert. Mr. Lascelles is constructing several cottages at Croydon on his plan, which certainly appears to deserve inquiry.

TOOLS AND CONTRIVANCES USED IN HANDICRAFT.

The course of Cantor Lectures on "The Material, Construction, Form, and Principles of Tools and Contrivances used in Handicraft," delivered at the Society of Arts by the Rev. Arthur Rigg, at the beginning of the year, and referred to by us at the time, are now being published at the Society's "Journal." The first two, already issued, refer wholly to early nations, and will be found very interesting.

THE SHAFTESBURY PARK ESTATE COMPANY AND THE WANDSWORTH BOARD OF WORKS.

The Shaftesbury Park Estate Company and the Wandsworth District Board of Works are again at issue respecting the drainage of the company's houses, and the Board now threaten to cut off the connexions made with the sewers. It may be remembered that the houses on the estate were originally drained at the back, which the Board objected to, and the result of proceedings in Chancery taken by the company to prevent the Board interfering with the drains was, that the company were ordered to conform to the Board's regulations as to drainage. Not having done so, the company were last week desired to attend the meeting of the Board to show cause why the connexions with the sewers should not be cut off. Mr. Longcroft attended on behalf of the company, and stated that any alteration would greatly inconvenience the occupiers, and he suggested that some arrangement should be entered into between the company and the Board. Whereupon the chairman stated that it was the unanimous decision of the Board that the drainage must be in front of the houses. He added that everything that could be done had been done by the company to oppose the District Board, by the filing of bills in Chancery, and going before the Metropolitan Board of Works, and the company now came to the District Board and asked them, after the decision given, and after all the trouble they had been put to, to alter their determination. The answer of the Board simply was, that the order to disconnect the drains must be carried out. The effect of this decision will necessarily involve the reconstruction of the drains on the estate, and a large expenditure. Why were not the proper inquiries made in the first instance?

OLD BROMPTON, NOW SOUTH KENSINGTON.

We propose recalling another visit to what was lately known as Old Brompton.* Wending our way from the head of the Grosvenor Canal, the site of which is now spanned by the iron ribs of the Victoria Station, we cross some of the land appertaining to Ebury Farm, to the king's private road, and so on to the elbow of the road which crossed the Tybourne brook, whose meanderings might be traced through its sedgy banks on the site of the present Cadogan-place.

From the partially-built Sloane-square, we turn down a narrow lane of rustic buildings till we reach the back of Colville's nursery gardens on the left, and Blackland's house on the right. The fields of Box Farm, and the open Chelsea Common are before us, and the present Marlborough-road, at that time a country lane, brings us to the Admiral Keppel Tea-gardens. Hence, by the narrow lane with the pleasant garden-grounds and hedge-rows on either side of us, we arrive at Old Brompton at the very spot where the South Kensington train now lands its passengers.

The long country ramble, occupying some half to three-quarters of an hour, has been pleasant enough. The birds carol in the air, or chirp in the hedgerows, and sweet odours fall upon the sense in the freshly-mown grass, or from the blossoms in the gardens. The general business of life was slower certainly then than at present, when the return-ticket is available in a quarter of an hour perchance, and the same business is transacted within the sixty minutes, which in the old time would have occupied half a day.

We will not pause however to inquire if the general amenities of life have suffered by the change, or the artificial gained strength in our constitutions by that intimacy with the grim genius whose food is coal and water, whose pulsations are in the piston-rod, whose breath is steam, and whose scream is a lively imitation of sensation. We will defer moralising upon the abuse of the boon which genius gives to man, or it would bring us to the old old story of "Midas" over again. We will at present take things as we find them, and we are in the neighbourhood of the collection of the art-treasures—on the very ground which but a few years since held the largest collection of natural growth and artificial culture in the country, the proprietors of which were Messrs. Loudon & Wise. When enjoying the well-cooked chop in the artistic grill-room of the South Kensington Museum, and whilst noticing the excellent arrangements and agreeable accessories to comfort and convenience, we are surprised at the small space of time that has passed since this site formed a portion of walled-in private grounds in the occupation of a private gentleman, although of public name (Greenwood), the partner in the well-known firm of army agents and bankers, Messrs. Cox & Greenwood, Craig's-court, Charing-cross. It was here that the Duke of York and other celebrities of the times had been entertained.

From the year 1681, fifty-six acres of land, extending from the Kensington-road to the boundary of these private grounds in Old Brompton were devoted to horticulture. Curiously enough, the present Horticultural Gardens of South Kensington occupy the site of those once maintained by Loudon and Wise, whose collection of all sorts of trees and shrubs was spoken of by Evelyn with such eulogy, and whose artistic adornments at Kensington Gardens evoked the praise of Addison. The stock of plants and roots was so extensive, that, valued at only one penny each, it amounted to the sum of 40,000*l.* It was in those gardens that the gilly-flower was cultivated to such perfection as to obtain for it the well-known name of the Brompton Stock. The site of Trinity Church and Brompton-square were all market-grounds,—in the time when Farren, Mrs. Faucit, John Reeve, and Yates (all inhabitants of this locality subsequently) were young people, for Miss O'Neill, Mrs. Siddons, and John Kemble had disappeared from the play-bills, and Kean and Young had occupied the attention of the Town; nevertheless, the old names took precedence in the remembrance of the playgoer. But of Brompton Park Nursery, perhaps, more might be said than of any other in the kingdom. For 170 years it had flourished in all its beauty. It had been spoken of by two of the most renowned men of the time,—men as amiable as excellent, and men of extensive power and genius. That half-mile of wall grew the finest of vines, and they had thrown out tendrils to the soft summer air, and had withstood the winter frost undisturbed through all the stirring time of revolutionary action even before the weak and cruel simpleton James had been hurried unceremoniously from Whitehall by his son-in-law,—even to the change of dynasty from the house of Stuart to that of Hanover,—even to the period of the Great World's Fair in 1851, when the moral revolution in society became greater than any other which had preceded it.

To part with this old nursery was to part indeed with an old friend of many associations. Close adjacent was the nursery of Mr. Kirke, whose careful cultivation figures forth in many a number of the "Botanical Register," published in the year 1815. The editor of that journal of horticulture was Sydenham Edwards, whose grounds were in great favour at the period, and occupied the space which the present Hospital for Consumption and Diseases of the Chest, with the streets adjacent, has long since covered. These grounds, which extended from the Fulham-road to Old Brompton, remained much the same till 1844, when the before-mentioned Hospital was the first intimation of an altered site.

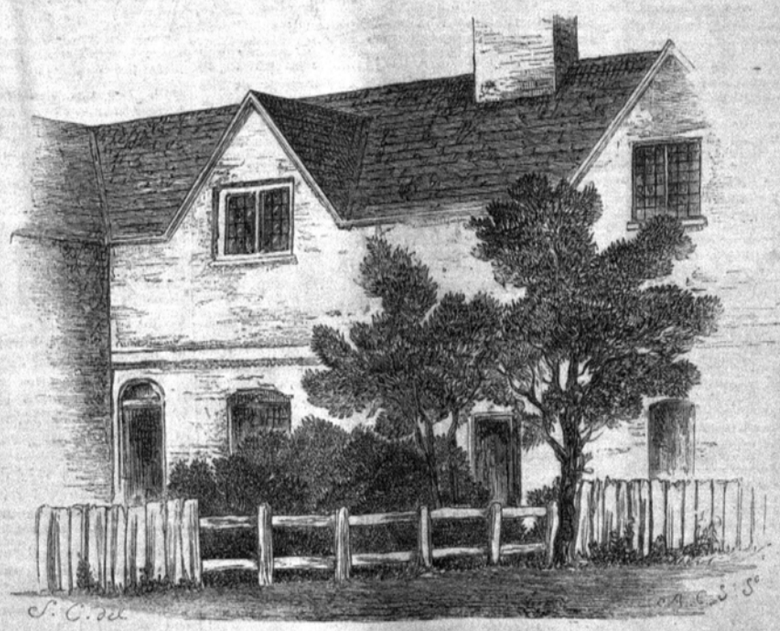
We must remain, however, in the Old Brompton-lane a little longer, so narrow at the Bell and Horns that you might fairly jump across it, with the elms and limes, and poplars and aspen boughs forming a green vista to look down from the hot and dusty Fulham-road. One mile from Hyde-park-corner in this suburb and you were shut away completely from the bustle and noise of the town, and had the sweet odours from the strawberries in the early morning, as the women passed you with their baskets on their heads, from the neighbouring grounds.

That most agreeable novelist, and master

* See vol. xxxii., p. 828.

OLD BROMPTON, NOW SOUTH KENSINGTON.

View of the Old Brompton-road, near the "Hoop and Toy," as seen from Onslow-terrace in 1833.



Part of Methwold's Almshouses (1870).

of literature, the late Lord Lytton, gives a very pretty picture of this suburban locality, in his novel of "Godolphin." Though slightly satirical, it was perhaps applicable to the period. "Lord Falconer rattled on, as they drove along the brilliant streets, through a thousand topics, of which Godolphin heard as much as he pleased; and Falconer was of that age and those spirits when a listener may be easily dispensed with. They arrived at a little villa at Brompton; there was a little garden around it, and a little bower in one corner, all kept excessively neat, and the outside of the house had just been painted white from top to bottom, and there was a verandah to the house; and the windows were plate-glass with mahogany sashes, only here and there a Gothic casement was stuck in by way of looking 'tasty,' and through one window on the ground-floor, the lights shining within showed crimson silk and gilded chairs, and all sorts of finery. Louis Quatorze in a nutshell! The reader knows the sort of house as well as if he had lived in it. Ladies of Fanny Millinger's turn of mind always chose the same kind of habitation. It is astonishing what a unanimity of taste they have; and young men about town call it 'taste' too, and imitate it in their own little *tusculums* in Chapel-street." "After having threaded a Gothic hall 4 ft. by 8 ft., and an oval conservatory with a river god in the middle, the two visitors found themselves in the presence of Fanny Millinger."

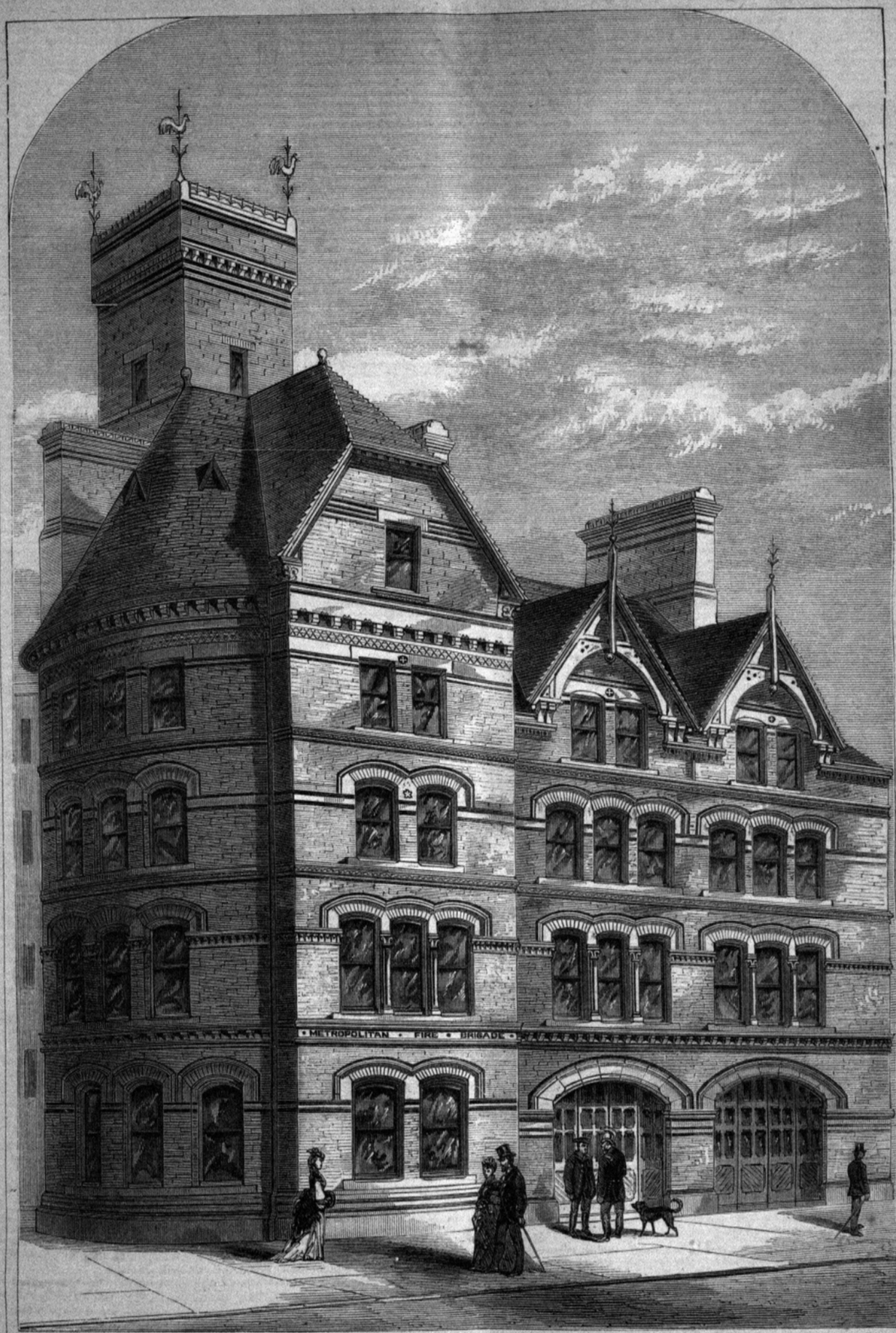
The repose and seclusion of "Old Brompton" were especially well regarded by all those whose lives were passed before the stage lamps.

Pass we on, however, to the lane which led by a wicket-gate into Ramsay's Nursery, celebrated for the careful culture of the yellow rose, before entering which, however, we must look at those quaint old Almshouses in the time alluded to at a much lower level than the ground adjacent, but since completely obscured by their loftier surroundings. So altered is the site that we had some difficulty in identifying it. Nevertheless, there they were, some twelve months since, bringing as it were the past and present in strange proximity.

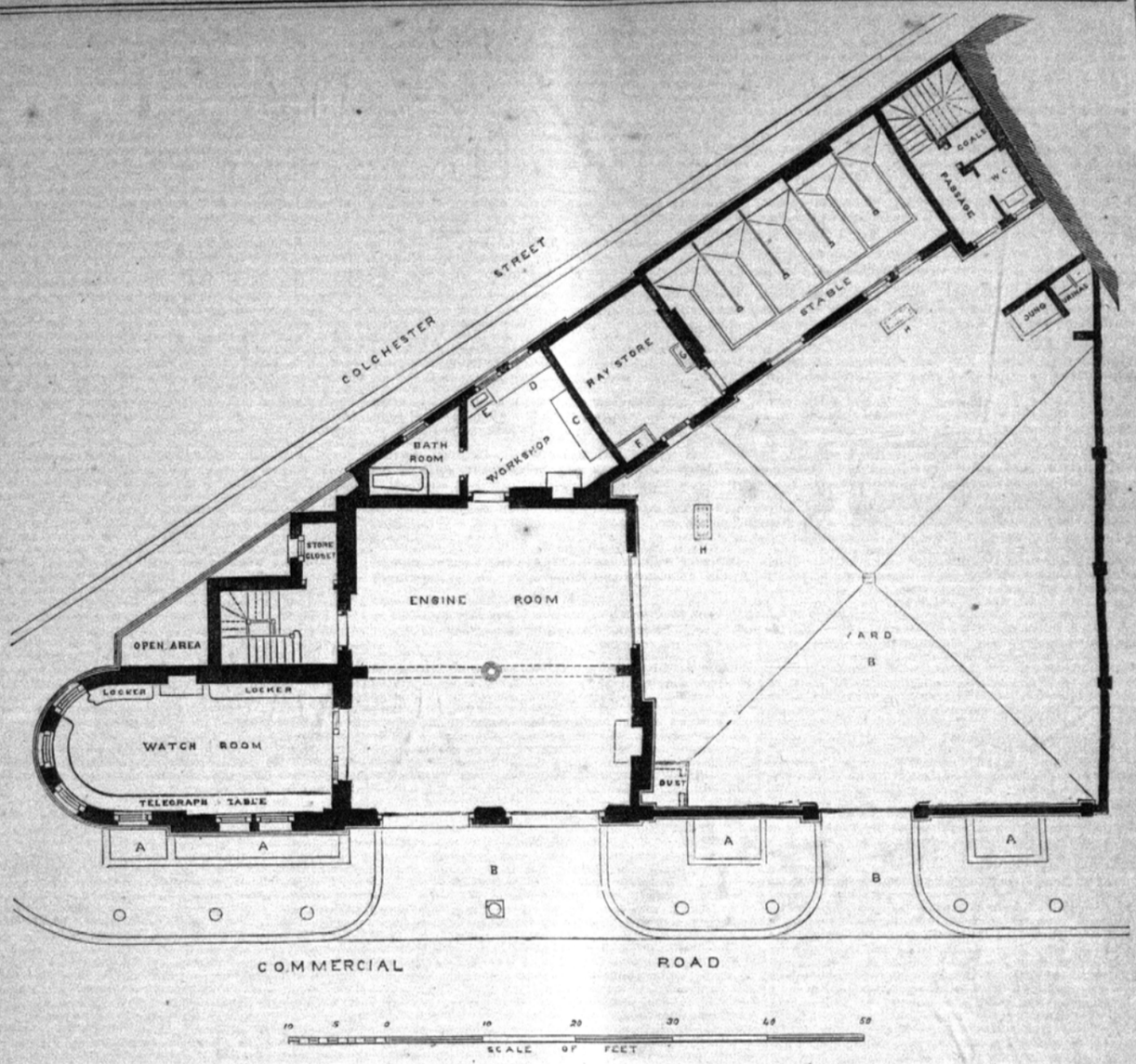
The houses of this charity of William Methwold, esq., bequeathed by will bearing date February 28, 1652, have but very recently disappeared. It was a hospital for six poor women, such to be single, aged fifty years, and of good repute. Sixteen acres of land were settled upon the charity, and each almswoman received 4*l.* per annum. Difficulties occurring in fulfilling the will, the parish filed a bill in Chancery, July 17, 1758, to obtain payment of the pension, and the decree at this date was fully effected. Subsequently the charity was paid by the proprietor of the Hall House Estate.

They occupied three sides of a small quadrangular space, and, surrounded as they were with pleasant garden-grounds in the nook of a retired country lane, formed a pretty little rustic bit to look upon.

The homely and picturesque spot has passed away, like many another; the nightingale warbles here no longer; and the sixteen acres of land are, doubtless, now of such a valuation as could never have been conceived, even in the wildest dream of William Methwold. It will not be amiss if one of these days we inquire as to the appropriation of the funds.



THE FIRE-BRIGADE STATION IN THE COMMERCIAL ROAD, LONDON.——Mr. George Vulliamy, Architect.



NEW FIRE-BRIGADE STATION, COMMERCIAL ROAD.—*Plan.*

A. Iron grating.
B. Mount Sorrel paving.
C. Movable table for cleaning hose.
D. Vice-bench.
E. Sink.
F. Cornbin.
G. Cupboard.
H. Inspection pit.

THE NEW FIRE BRIGADE STATION, COMMERCIAL ROAD.

WE give a view and plan of the new Brigade Station in the Commercial-road, London, which has been erected for the Metropolitan Board of Works from the designs of their architect, Mr. George Vulliamy. This is the superintendent's station of the C district, from which there is telegraphic communication with the chief station in Watling-street, and with each of the stations in the district. Accommodation is provided at this station for the superintendent, twelve firemen (six married and six single), one coachman, five horses, three fire-engines, and two fire-escapes. The superintendent occupies six rooms on the first floor. The single men have a kitchen and two bedrooms, and the married men have each a kitchen and two or three bedrooms, according to the necessity of their families.

LOOK AFTER YOUR CISTERNS.

SIR,—The value of a good supply of water, thanks to your efforts and those of other sanitary reformers, is much better appreciated than formerly, but the public mind still needs to be impressed with the fact that good store is not the only thing to be desired, obtained, and paid for, all further care concerning it being dismissed. Open cisterns require cleansing more or less frequently, and especially at this season, or else water, that very useful agent of health, may convey disease, as its very usefulness for cleansing depends on its readiness to absorb or combine with other matter. If cleansing was the only purpose for domestic water-storage, the amount of contamination derived through neglect of cleaning out cisterns would be of small account; but there is another use, inferior as to quantity, but all-important with regard to quality, namely, for drinking and culinary purposes. Contamination may take place when there is no visible source of uncleanness (as in the case of a soil-pipe ventilating through the waste-pipe), but generally a need of cleansing will manifest itself to the eye, *i.e.*, *when* the eye is brought to bear upon it; and here is the main cause of the neglect. A cistern in a kitchen, with the top edge about 6 in. from the ceiling is not very easily inspected, but without or even with a cover it is liable to receive dust caused by sweeping, besides being in some measure exposed to a tainted atmosphere; and yet there are few cisterns so placed as more readily to invite attention, though they may be more accessible.

It seems to be studiously contrived that, for good or for evil, cisterns should be placed out of reach or out of sight. Not always for evil. I have seen a cistern placed in a top room devoted to the purpose, kept very clean, and locked up to prevent the entrance of children. But, out of sight too frequently means out of mind, and then it requires to be seen to be appreciated, the amount of uncleanliness that can be tolerated, and the objectionable places chosen for cisterns, in a dark cellar, or under the roof tiles, without cover or partly covered, or outside on the top of some outbuilding, with wooden cover, but exposed to the hot sun, which promotes a green, slimy vegetation in the water, and a fungoid growth on the underside of the cover. These are some of the choice places where water is allowed to rest undisturbed and accumulate dust. It may be harmless coal dust, or it may be house dust, or road dust, charged with animal matter. Perhaps the worst position for a cistern is close to the ceiling of a room, with access by an opening in the floor of the bedroom over, just as large as the joists will admit of; it is a capital trap for blackbeetles, and even rats find a watery grave there, though the fact may not be known for a long while after; and as for dust, a sample may be seen on the thick veil of cobweb which has arrested some of it. But there is another source of evil, viz., unguarded communication with the water-closet. The cistern must supply the closet pan with water, and is too apt in return to be supplied with foul air, and if the waste-pipe discharges into the soil-pipe the evil is enormously increased; trapping the pipe is an untrustworthy remedy. Should the cistern be inside the house the danger from this nuisance

is greater than that of only fouling the water, as a current of air from the soil-pipe is diffused in the house; it is better to stop up the waste-pipe and stand the risk of an overflow. No mere cleansing of the cistern should be allowed to suffice in the case of foul air from the closet; an alteration of fittings is absolutely necessary, but in other cases constant vigilance will be beneficial, especially at this season.

The constant water-supply to some parts of the metropolis is, doubtless, notwithstanding certain well or ill founded objections to fittings, a greater boon to the poorer classes than they know how to appreciate, in doing away with the necessity for cisterns; yet cisterns, and even butts, are still preferred by many, and the need for their being cleansed is as great as ever. Unfortunately the cost of the complicated contrivances which are supposed to be necessary to adapt water-closets for the constant supply is prohibitive to owners of very small houses, and, in most cases where it is used, the apparatus reduces the high pressure to low pressure, a great loss of flushing power.

Is it necessary that water in store should be subject to contamination? Closed cisterns might, I believe, be used with advantage both for intermittent and constant supply. Wherever placed, they could be made to exclude all dust or foreign matter that did not come through the supply-pipe, and though difficult to inspect internally, that would not be necessary for years. Regard for your space prevents my giving details.

I hope this letter will induce some householders to look to and clean out their cisterns.

F. H. McLachlan.

LARGE FARMS AND SMALL FARMERS.

Sir,—I was impressed with the practical thoroughness of the article on "Peasant Gardens and Peasant Farms" in the *Builder*, and can confirm by a wide range of experience in farming, from a rood of land to 800 acres, that only extensive stretches of land will repay steam cultivation, and that high-farming—as stock-farming is often termed by the slang writers of the press,—can be best carried out on large areas.

But unless we admit an intermediate extent of homestead acreage, we shall be forced to the assumption that farming will be divided into two sections—the farm, and the garden; and the agricultural proprietors into two grades, the farmer, and the gardener or labourer. My experience points to an intermediate proprietary corresponding to the yeomen class of olden, and of the present time. Men who will cultivate the land around their homesteads aided by all the improvements of steam-worked machinery, and town sewage; who have a love for their occupation, not simply a vested interest in it; who dignify it by their sturdy toil, instead of being a bailiff of so many acres: men to whom science will lend its light and leverage to exalt the noblest occupations.

> From toil-turn'd muck, to win the food of man,
> And rich ripe plenty wrought by science' aid;
> The world, leave better than when he began
> The tiller's craft, and honest yeoman's trade.

While admitting that for small hedged-in plots the spade, prong, and hoe, are the only implements by which the ground can be worked, I wish to point out that small areas of ground, when undivided by hedge or ditch, may be worked by horse or steam, collectively. As facts are to theories, as substances are to shadows, I will give the result of seven years' experience of facts, carried out to elucidate the value of spade culture for gardens and allotments and small holdings, and the same ground worked by horse-power. I will at once state the result of my experience. That wherever it is possible to use horse-power, spade cultivation is a waste of human life, and wherever steam-worked machinery can be applied, the use of horse-power would be a waste of a nation's wealth; to this I add, that gardens in many cases may be worked by horse-power, and small farms by steam-power. What is a steam-cultivated farm of three thousand acres—owned by one man and managed by one bailiff—but an aggregation of small farms of some former period? Surely the method of cultivation does not necessarily compel divestiture of rights. Science, which is the hand-maiden of toil, dividing and diversifying toil, could find ample work for thirty yeomen proprietors on 3,000 acres. The absence of hedges and ditches on the 3,000 acres, so as to allow the steamer and drum to draw the "drain-plug" through the land from high to the low levels; the steam-worked ploughs, reapers, and tram-trucks,—the use of all these need not invalidate individual rights, and proprietary results. Every harvest sees a new field-measurement for crop acreage; hedges and ditches baulk rather than help the measurer. The yeoman would be reliant on correct measure for land or yield, the same as he is now to factors and salesmen for disposal of produce. Science would train one of the yeomen for surveying, another for chemistry, another for drainage or hydraulic engineering, another for steam engineering, another as an accountant, another as travelling buyer or salesman, another as a veterinary surgeon, another as builder, and so on; each with his distinct vocation. Thus steam and sewage would be well applied, instead of being applied at a loss of capital, from the want of a training which it would be unfair to expect from one manager of a large steam-worked farm; for we cannot gainsay the fact that until after several years' established operations, steam-farming fluctuates between gain and loss. In conclusion, I will detail how I obtained double crops from a garden which was *not* worked by the spade, but by the hough and horse-hoe at less cost than by the spade. The system adopted was what is well known as the "ridge-and-furrow,"—in straight lines, but the principle of cropping was to have crops in the furrow as well as on the ridge, with scarcely any intermission of growth. The result was superior crops, clear ground, and double produce from the same area of land. In some instances, crops which would not have lived if planted on the open flat ground, throve with vigour in the trench, and shade of the ridge crops.

J. Charles King, Author of
"How to Select a Farm and Manage it," &c.

THE FRENCH EXCURSION OF THE ARCHITECTURAL ASSOCIATION.

The head quarters of this excursion, under the guidance of Mr. Edmund Sharpe, M.A., will be Angoulême, where the party will arrive on Saturday, August 28th. The number is to be thirty only this year, and is made up already. The expedition promises to be of much interest in taking stock of some of the domed churches and their details, not measured and illustrated before.

"L'Architecture Byzantine en France," par Felix de Verneilh, Paris, 1851, 4to., may be referred to; also Fergusson's "Handbook," French Architecture, chap. ii., Aquitania.

The following is a list of the principal places which will be visited. Any spare time in mornings and evenings will be devoted to Angoulême Cathedral, &c.:—

Monday, Aug. 30th.—Fleac, Linars, Trois Palis, Nersac, and St. Michel.

31st.—La Couronne, La Palud, Roulet, St. Estephe, and Mouthiers.

Sept. 1st.—Moutiers, Plassac, Mainfonds, Champagne, and Blanzac.

2nd.—Puyperoux, Montmoreau, and Chalais. (Sleep at Chalais.)

3rd.—St. Quentin and Aubeterre.

4th.—Passirac, Chillac, Berneuil, Coudeon, and Barbezieux. (Return to Angoulême.)

Sunday, 5th.—At Angoulême.

6th.—Chateauneuf, St. Simon, and Bassac.

7th.—Bourg Charrente, Gensac, and Cognac. (Sleep at Cogeac.)

8th.—Cherves, and Châtres (Cistercian Abbey). (Return to Angoulême.)

9th.—Plaizac, Rouillac, Gourville, and Lanville.

10th.—Ventouse, Cellefrouin, and Larochefoucauld.

Saturday, Sept. 11th.—St. Amand de Boixe, and back to Angoulême, where the final dinner of the excursion will take place at six o'clock.

Sinking an Artesian Well at Warrington.—Mr. Chapman, engineer, Salford, has just completed the sinking of an artesian well, for the brewery firm of Messrs. Walker & Sons, Warrington. The work of sinking the shaft was commenced on June 21st. It has been carried to a depth of 33 ft. and its diameter is 6 ft. A 12-in. bore-hole has been drilled to a further depth of 30 ft., and the level of the water stands at 32 ft. The supply is obtained from the new red sandstone. It is abundant in quantity, bright and pure, and free from surface impurity. About 200 gallons per minute are at present being pumped.

"THE UNIVERSAL ARTIST."

Sir,—In arguing for the domination of historical painting and sculpture in the realm of the formative arts, I do so in a wider sense than that of taking architecture out of the hands of the architect: I desire that they should hold the same commanding position in public estimation as they did in Greece and Italy, and even to take architecture into their hands when either painter or sculptor has the capacity for handling it in a masterly manner.

We may learn from the careful and comprehensive work of Müller that the highest formative arts were not included under the title of *tectones*,—did not belong to that company of workmen of whom the architect was the chief. This writer says, "I have tried to introduce the expression 'tectonics,' to denote a scientific notion which we can scarcely dispense with, although in doing so I did not overlook the fact that among the ancients, masons and joiners indeed, *but not workers in clay and metal*, were called *tectones*"; and in the same work we find that "Phidias the Athenian now appeared, an artist whose genius was so vast and his fame so acknowledged that the works of Pericles's age were *all* carried on under his direction, and *the entire host of artists of every kind assembled at Athens were occupied in following out his ideas.* He himself worked especially at colossal statues composed of gold and ivory, for the more perfect execution of which, *unexampled liberality on the part of the states*, and a more extended technical knowledge, lent their assistance." It is more than probable, therefore, that, contrary to "T. L. D.'s" opinion, Phidias did dictate the proportions of the Parthenon. For whose sense can be more sensitive to proportion than either the great painter's or the great sculptor's, to those proportions which are most in conformity with human taste? But in the days of Phidias proportion was not merely left to the decision of an intuitive taste. It was a science,—a science which art may recover when the nation can get time and patience to permit thought to dive deep below the filmy surface of things.

We may get some notion from the following passage, of how absolute the sway of Phidias was over the formative arts of his epoch. "Under his direction were weavers of variegated stuffs, embroiderers, whose tapestries must not be forgotten when we wish to call up an idea of the general effect of those temples and ivory statues." "The movable drapery of Pallas, according to Philocorous, was forty-four gold talents in weight, yet its thickness did not much exceed a line." From these facts it is evident that the relative position of the great artists of the human figure to workers in other branches of the formative arts was precisely the same both in the epochs of Phidias and Raffaelle. I arrived at the conclusion that this state of things must exist, when art attains to its greatest perfection, from studying the genesis of ideas and the natural order of interdependence in the arts, and from the evidence of the cinquecento, before I lighted upon the important facts which have been recorded of the age of Pericles, and quoted above. And it must be clear that the Greeks put the same value on their own saying of "Let every cobbler stick to his last," as I did in my letter of the 31st ult. It was intended as a caution to those beings of very limited powers, who were incapable of any effort beyond bungling and patchwork.

W. C. T.

BEWICK AND NEWCASTLE.

Now that the British Museum will be the custodian of the brothers Bewick's splendid art collection, considerable rivalry for possession of the cuts and original drawings has come to the front; and the Natural History Society of Newcastle-on-Tyne has almost claimed them. The University of Cambridge is also anxious to become their possessor, and if it had been a question of money an almost fabulous price could be obtained for them.

It is too true, however, that the town and district that Bewick's services to art have made famous, have never appreciated their townsman's merits, and the family of Thomas Bewick have not had much reason to bequeath this art collection to Newcastle-on-Tyne.

The workshop in St. Nicholas Churchyard, in which he laboured so usefully, was legally wrested from his children; and it is only necessary to take a stroll up West-street, Gateshead, at the present time to find an example of how the

corporation fulfil the conditions of an agreement between them and the Misses Bewick.

Thomas Bewick himself would, if alive, have unquestionably felt prouder of the present capabilities of wood-engraving than any monuments of stone or brass erected to his name.

It is not surprising to learn that very few of the inhabitants of Gateshead were aware that they had for neighbours two of the daughters of Bewick, until it was announced in the London papers, and now all are anxious to "leave their cards." L.

CAUTION TO BUILDERS AND THEIR HORSEKEEPERS.

The rapid rise in the value of draught horses used by builders and trades in connexion therewith is such as to make the loss of a horse a serious item against building profits, in many instances, draught-horses fetching at fairs as high figures as 100 guineas each, a price actually paid for the cattle belonging to the rollers and mud-carts of St. George's, Hanover-square. These giant horses, moreover, consume extra corn, hay, and chaff, and it so happens that *pari passu* has arisen the cost of provender. The present hay season is admitted to be a failure, few farmers stacking sufficient hay for their own use. To show the heavy cost of keeping horses, no better gauge can be had than the fact of hundreds of light horses now being in the market for sale at any price. The great London carriers and the London General Omnibus Company estimate this year's increase in the price of horse-provender, not by hundreds, but by thousands, of pounds.

To alleviate this state of things, our great corn, hay, and straw dealers have turned their attention to a foreign supply, and compressed hay has been imported from Hamburg to a large extent. It is to this provender the attention of builders, horsekeepers, and veterinary surgeons is particularly directed.

Near to the town of Barnsley, in Yorkshire, a large number of horses are kept for colliery purposes, and for several days last week all operations were stopped, and 500 men and boys thrown out of work at one colliery, in consequence of illness and deaths among the horses. On one day eight horses died, valued at 400*l*. On inquiry, it appears that seventy horses in one pit were healthy and in good work, when foreign hay was given them to eat. After partaking of the stuff for a few days, the whole seventy fell off in their food, and refused to eat the hay, and a few days afterwards a number of the draught-horses and ponies were attacked with influenza, followed by bronchitis, and pneumonia, after which typhoid fever of a very malignant character set in. The result was that several died and numbers are under veterinary treatment.

The veterinary surgeons have made a *post mortem* examination of the animals, and are all of opinion that the disease, in the first instance, was caused by the foreign hay eaten, and this view is supported by the fact that the hay in question was brought into the port of Hull, where recently a number of horses have died through eating the same Hamburg shipments.

Those who contract with hay-dealers should see that this foreign hay is not supplied.

NEW CONGREGATIONAL CHURCH, WELLINGBOROUGH.

This building, which is being erected from the designs of Mr. Edward Sharman, architect, at a cost of close on 9,000*l*., is making rapid progress. The principal frontage faces towards High-street, and the site is well elevated above the road. In its plan the shape of the church is an ovel, with north, south, and west projecting porches, over which are ways of access to the gallery and chancel, or apse-like recess at the east end, divided from the church by a lofty and well-moulded arch, in which the organ will stand. Thus it will be at once seen that the form of a Maltese cross will as nearly as possible describe the shape of the ground plan. The style of architecture adopted is Early English somewhat freely treated. The stone used in the construction of the building is of a warm yellow tint, and is of local extraction. It is known in the county as Duston stone. The dressings are Bath stone, from the Farley Down quarries. The columns to the window mullions are in each instance of red Mansfield stone. The entrance-gates and the gates to the main doorway are reached by a flight of some dozen steps. The doors are of deal framing filled in with V-jointed panels of wainscot oak. An ornamental wall of Duston stone, coped by worked and moulded brick, together with Bath stone capitals to the piers, separate the buildings from the road. A gallery, which takes the undulated wall line, is carried round rather more than one-half the building, supported by iron columns. The roof is not open. It is flat and panelled in plaster. The organ is recessed behind what one may term the chancel arch. This arch is supported by red Mansfield columns, and carved capitals, representing respectively wheat and grapes, and the lily. There is also a carved running ornament—ivy—up the soffit of the arch. The pulpit will be a feature; as yet it is not fixed. The seats are all open benches. Mr. John Beddington, of that town, is the contractor for the works. The carving has been executed by Mr. Harry Hems. Mr. Paine is the clerk of the works.

BAD MATERIALS UNDER METROPOLITAN BUILDING ACT.

Mr. Thomas Eyres was summoned by Mr. Knightley, district surveyor of Hammersmith, with respect to the quality of the mortar used in the construction of houses in Gratton-road. Two samples of the mortar taken from the buildings were produced, it being stated that it contained 20 per cent. of sand and 80 per cent. of loam. The defendant had been cautioned for using mould.

The defendant said they were not fair samples.

Mr. Knightley explained that the lower part of the wall was built with that mortar, but better mortar was used for the upper portion.

The defendant said he used lime, sand, and refuse of a brickfield in equal proportions to make the mortar hard.

Mr. Ingham left the Bench to inspect the work, and on his return made an order for the wall to be pulled down in seven days.

The defendant said he should take the case to another Court.

Mr. Ingham said he had done with the case.

SALARIES OF MUNICIPAL SURVEYORS AND ENGINEERS.

Sir,—As a constant reader of the *Builder*, I have seen with much satisfaction accounts of the proceedings of that newly-formed Association of Engineers and Surveyors to Municipal Authorities, but not being sufficiently acquainted with the object of their intentions, whether it be for the mutual interchange of opinions for the general good of sanitary science, or for the advancement of their own individual interests, or both, I do not know; but I have for some time taken a great interest in works connected with town improvements, and as the officers who design and superintend such improvements are necessarily engineers, I have often been and am surprised at the small proportion their salaries bear to the important and varied works they carry out.

Indeed, it is beyond the power of some of them to make provision for the time when age incapacitates them from performing their duty; and, looking upon the matter in a purely disinterested light, I would venture to suggest to this Association the advisability of taking steps with a view to obtain superannuation. I see a Bill is being passed in the present session to superannuate county surveyors in Ireland, and as the amount of their salaries favourably compares with those of borough surveyors, I fail to see the justice of providing for one and neglecting the other. Moreover, the duties to be performed by the surveyor to a corporation would be greatly improved, and the work more satisfactorily executed, were the said officers placed beyond the entire control of local influence. L. L.

CLAY A MINERAL.

A suit has lately been heard before Vice-Chancellor Hall (Linskill *v.* Charlton) which is interesting in its result, as it affects the brick trade.

The plaintiff, Capt. W. Linskill, Lord of the Manors of Great and Little Moorsom, in the parish of Skelton, in Cleveland, filed his bill for an injunction against the defendant, William Charlton, the owner of an encroachment of four acres, part of the Moorsom Moor, called the Low Moor, whose father (being then owner) had on the occasion of the Moorsom Inclosure signed (with other encroachers) an agreement to hold the encroachments subject to the right of the lord to the minerals under the same. His son, the defendant Charlton, acting (as the plaintiff contended) in contravention of such agreement, was proceeding to dig for and get clay, and to turn his encroachment into a brickfield.

The Vice-Chancellor made a decree in the plaintiff's favour, granting the injunction, thus deciding (in accordance with other decided cases) that clay is a mineral in the ordinary sense of the term.

GENERAL FOREMEN AND CLERKS OF WORKS.

BRICKLAYER *v.* CARPENTER.

Sir,—I have long been impressed with this fact, that whenever your advertising columns are used to invite candidates for the position of clerk of works, or general foreman, it is almost certain to be especially stated,—"A Carpenter and Joiner preferred."

Now, Sir, in past years, when in building construction timber framing, &c., was more the rule than the exception, and wood generally was used in greater quantities than modern architects deem essential, and the log timber was sawn and converted into its several uses, and the joiners' works prepared on the works, I admit the above position may have been well filled by a carpenter. But time has changed that order of things, and I contend that the above stipulation is neither justifiable nor necessary to obtain the fittest man.

Having been engaged as foreman in my own branch, general foreman, and clerk of works on important public and private works for twenty-five years, I can speak with some authority.

When I ask, why is the carpenter preferred, I am told they are the most respectable. No doubt, owing to the nature of their work being more clean than the other branches, they can appear more respectable, as far as dress goes. I am told they are the most educated; and, no doubt, time has been when there was some truth in that; but that they are now is open to question. It is said theirs is the leading branch. This I most emphatically deny. That a man can be perfect only in one trade is a well-known fact. The question is, "Which trade should be the most fit to hold the leading position, and to be entrusted with the superintendence of the whole?"

To be a competent joiner a man must pass all his early life in the shop, with perhaps an occasional turn in the building-fixing, when, mark, the superstructure is completed. When a joiner obtains his first appointment and emerges from the back of the bench, he must of necessity lack the practical knowledge of the most vital points in modern construction.

Is the joiners' shop the place to get experience in earthworks, concrete, brickwork, masonry, &c., the nature and behaviour of limes and cements,—in fact, any of the multifarious duties, the knowledge of which constitutes a genuine clerk of works or general foreman? It is all very well for a man to pick up a little smattering of technical terms from the leading workmen in the different branches, that he may be better able to answer questions when interrogated upon any particular point; but, is that sufficient?

Again, foundations, brickwork, masonry, form the largest financial items, and should be in the hands of a man that can adopt the most ready and complete systems to insure success and economy, instead of delegating it,—as a carpenter must necessarily do,—to a deputy, at, perhaps, a 1*d*. per hour extra pay, who does not always feel an interest in the job. Why should he, seeing the other is to have the credit? Whether the work is good or bad, or comes out to pay or not, it is all the same to him. With very rare exceptions the joiners' work and framing, roofs in particular, are prepared at the builder's yard, which is frequently miles away, and are brought to the building ready to fix, so that the carpenter's work is the smallest item of labour done on the spot.

Surely a bricklayer, who serves the whole of his time on the building, and who, especially if he has been reared in the country, has to work his way through all the grades, even to making his own scaffolds and helping to make his own mortar, should be the man best able in after years to direct and instruct others, and to judge of a workman's ability to earn his wages without seeking advice from others. I say the bricklayer, if he would only grasp the opportunities he has at command to acquire the necessary practical knowledge of the other branches immediately in connexion with his own, should be the fittest man. And I make an earnest appeal to bricklayers to awaken themselves to the importance of these remarks, and see their true position and fit themselves to occupy it. To encourage them, they have only to look around and see its consummation in instances not a few, but if they were more general, the eye would not so frequently be offended by those frightful abortions that bear the name of brickwork.

The least they can do is to shake off the load of prejudice with which they are handicapped, in the race with the *carpenter*, for the leading position. The motto should be—"Let the best man win." A Bricklayer.

ALLEGED SYSTEM OF DEFRAUDING MASTERS.

On the 5th inst., at the Westminster Police-court, before Mr. Arnold, Edward Cummings appeared in answer to a summons charging him with obtaining the sum of 8*s*. 6*d*. by false pretences from Mr. J. P. Seagrave, proprietor of the Westminster Zincworks, 46, Rochester-row, Westminster.

Mr. W. D. Smyth, who prosecuted, stated that the case was an important one to masters who possessed a country business like the complainant, and the system pursued by the defendant was one by which masters were often defrauded. The defendant was employed by Mr. Seagreave, and on this occasion was sent to work at a public-house at Somers-town. The fraud complained of occurred on Friday, the 23rd of July, when the defendant by his time-sheet represented he had worked nine hours, whereas he had not worked at all, and had not gone to the job until late in the evening.

Proof having been given,

The defendant said that, although he was not at work, he was engaged on his master's business.

Mr. Arnold adjourned the case, ordering the defendant to find one surety in 5*l*. for his appearance.

MEDICAL AND ARCHITECTURAL SANITATION.

Sir,—There is an important sanitary suggestion just now brought under medical notice in Edinburgh that may be interesting to your readers as a hint in W.C. ventilation. Here so many of these closets being lighted and ventilated into the common staircase, that gives access to the different dwellings in flats, each W.C. requires gas light, which, when enclosed by glass in a veniduct or flue pipe, the mouth of which, opening at the seat, naturally carries away at once all vitiated air to the chimney where the flue terminates. Thus by the suction of a heated flue opening under the seat, not only are sewage emanations prevented from escaping into dwellings, but no person using this closet is immersed in vitiated air, and the household supply of water placed in W.C. cistern, so generally overhead, is no longer surrounded with a polluted atmosphere. The supply of fresh air entering near the ceiling, there need be no extracting foul-air flue but that opening under the seat of the closet, which may be made to act as powerfully as an Arnot stove, drawing even the fumes and smoke of tobacco into it. There is no great architectural difficulty in the introduction of such W.C. ventilation here any more than in the American cities, where it is adopted with success. J. K.

CREMATION.

Sir,—Professor Bernays, in a letter to the editor of the *Times* headed "Humation and Cremation," appears to think that cremation can never become the popular mode of disposing of the dead because it is opposed to a religious sentiment. Cremation is doubtless opposed by a prejudice, but by no means by a true interpretation of the injunction of "earth to earth."

This prejudice, however, would soon be overcome if the matter at issue were to be placed before the public in its broadest aspect. If the public were to be shown that in whatever way the body be disposed of after death it must be consumed, *i.e.*, in some sort be actually cremated; for nature resolves everything by combustion. Every human being, even during his existence, is over and over again consumed or cremated,—it used to be said once in seven years, it is now affirmed in a much shorter period of time. The only difference, therefore, between committing the body to the flames and burying it, is the difference between a quicker and a slower process of combustion.

Has education, scientific education, failed to help us to no broader interpretation of "earth to earth" than that of Mr. Seymour Haden? It would seem that it has not. The narrowness of that interpretation would convict thousands and tens of thousands of persons of having broken the letter of the law in consigning the remains of their relatives to graves of gravel, clay, and what not instead of to "earth." And in so doing, if Mr. Haden's interpretation were the correct one, they must have sinned against religion. And all who have consigned the remains of their relatives to vaults, catacombs, rock-cut tombs or lead, from the time of the patriarchs to the present day,—nay, even the disciples of our Lord themselves,—would stand condemned.

What, then, in their broadest sense, do the words "earth to earth" really mean? Why, nothing more than this, that all matters within, upon, and to the limits of the atmosphere of this planet is of the earth; and of the earth, earthy. That all living beings are composed of its elements, and must again be re-solved into them. Therefore, in whatever way we may dispose of the human tenement after the spirit has departed, we shall fulfil the sacred injunction of committing "earth to earth."

Mr. Seymour Haden's system would, if it were to be carried out to any great extent, be more noxious than the present one. The earth would become surcharged with animal matter, and infect the neighbourhoods, and beyond the neighbourhoods, of the cemeteries; for the earth,—even Mr. Haden's "earth,"— does not enter into chemical combination with the resolving elements, but for the most part holds them suspended till they can be re-appropriated by either vegetable or animal life.

Coffins of wood and lead to a certain extent prevent the earth from becoming surcharged with decomposing human remains. These receptacles part very slowly with their contents, and thus to some extent preserve the living from the evils of a free, but slow, combustion, under the surface of the earth.

The greatest evil of our present system of burial is this, that it withholds for too long a period those elements which are necessary for building up the tenements of a new generation, prevents them being quickly re-appropriated by the living. This is doubtless one source of disease and degeneration. The materials for 7,000,000 human beings are at this very moment thus withheld from circulation and re-appropriation in Great Britain. Cremation is, *par excellence*, the quickest mode of returning "earth to earth," for disseminating the material elements of the dead human body, so that they may be the most readily re-appropriated and utilised by the living. Moreover, to show in how general a sense the sacred injunction of "earth to earth," is to be taken, we have, as synonymous expressions, "ashes to ashes," "dust to dust," "clay," &c. It should neither be forgotten that nature has not implanted any instinct to bury, that for eons of time all animal life died and rapidly decomposed upon the surface of the earth. Seeing, then, that whatever mode of disposing of the dead be adopted, it must inevitably fulfil the injunction of "earth to earth," we have, as rational beings, to decide which mode will be the best for the common weal of humanity.

Cremationist.

TAYLOR'S AND TOBIN'S VENTILATORS.

Sir,—Upwards of twenty years ago, under the direction of the late Mr. George Taylor, schoolmaster, Leberton, Edinburghshire, I fitted up in the parish schoolroom there a number of upright flues or shafts rising 4 ft. from the floor-level, with openings 9 in. by 5 in., communicating with the external air, so that on entering the school the fresh air was thrown upwards, overhead of the pupils, without perceptible draught, rendering a sweet and pure atmosphere at all times possible without opening doors or windows.

The following description of what is called Mr. Tobin's inventions seems to me exactly an adaptation of Mr. Taylor's idea,—"Communicating with the open air, through a cellar-grating, vertical shafts 5 in. in diameter rise about 4 ft. above the floor, with open mouths, from which ascends to the ceiling an unbroken current of this outer air, like a fountain-jet, so that the interior air is kept as fresh and sweet as the external atmosphere around the building." I cannot say where my deceased friend Mr. Taylor got the idea, but I am certain that the merit of the invention is as much due to him as to Mr. Tobin.

Having long urged this plan of ventilation, I am glad to see its merits now disclosed *pro bono publico*.

James Kerr.

SCHOOL BOARD SCHOOLS.

High Wycombe.—The new Board Schools have been opened, and are designed to accommodate 1,000 children. Plans were prepared, and a contract entered into, for the erection of a block of buildings to accommodate 600 children for the borough only, with a master's house attached. But, a few months later, when the brickwork was reaching the ground-floor, the parish School Board decided to furnish a contingent of nearly 400 more children. The plans had to be enlarged accordingly, and an extended contract was entered into. The first contract amounted to 4,264*l.* 10s.; the second to 2,610*l.* 11s. 8d.; making the total cost of building alone 6,875*l.* 1s. 8d. From the rapid descent of the ground, the front elevation has a height of 60 ft. or more, with a range of six huge flying buttresses from the main building, the lower openings forming entrances to the covered playground underneath the front of the main schoolroom. This basement is some 70 ft. by 20 ft. in size, and will be a playground in wet weather. The buildings, being shaped like the letter L, have a frontage to the railway, and one also to the Cemetery-road, giving a total length on the two sides of some 250 ft. The style of the buildings is Early Gothic. The main staircases are of stone, and the material of the building is red brick, with slated roofs. All the windows have stone dressings, into which cast-iron casements are fitted. The whole of the fittings are of pitch-pine, varnished. The interior walls are painted to the height of about 4 ft. with the Imperishable Paint Company's paint of a purple-brown tint, finished with a black line, and the walls are coloured above. Between the floors, "sound pugging" is introduced, to prevent the voices in one room from interfering with school operations in the other. The contractor has been Mr. William R. Loosley. The architect was Mr. Arthur Vernon, of Wycombe.

Brynhyfryd.—On the 2nd inst., Brynhyfryd Board Schools were formally opened. A schoolroom was formerly erected at Brynhyfryd, and school work was for several years carried on there by a body of denominational subscribers; but some time ago the Swansea School Board took the schools into their own hands, and set about adapting them and further extending them to supply the accommodation required. The school-house then already built was capable of accommodating 264 boys, and the Board have since erected on the roadside, opposite the older buildings, a new girls' school, to accommodate 234 scholars, and an infant schoolroom, affording space for 220 infants. To these have been added a number of class-rooms, and residences for the masters and mistresses. Mr. George Harmain, the surveyor to the Board, is the architect, and Mr. White is the builder. The entire cost is something like 2,000*l.*

SCHOOL BUILDING NEWS.

Halifax.—The congregation of the Methodist New Connexion chapel, at King-cross, have had the memorial stones of a new school laid, which for a time will be used as a place of worship as well as a school. The school is designed in the Gothic style of architecture, the central window and gablet, with the flèche on the roof, being the salient feature in the design. On the sub-ground floor will be located the infants' class-room, and caretaker's house, with the heating cellars underneath. The ground-floor will comprise nine class-rooms, with appurtenances. The assembly-room will be over the class-rooms, and about 21 yards by 15 yards, and will accommodate 500 persons sitting, exclusive of the north and south galleries; the latter of which will contain the organ, the choir, and the scholars, the north gallery being pewed for regular members of the congregation. Underneath the south gallery will be placed the cooking kitchen, superintendent's room, and library. The rooms throughout will be fitted up with boarded dadoes, and the large room will have an open timbered roof, the ceiling of which will be boarded and stained. The architects are Messrs. Leeming & Leeming, of Halifax; the contractors are Messrs. Culpan & Sons, masons; Messrs. Dyson & Son, joiners; Messrs. Ackroyd & Mills, plumbers and glaziers; Mr. Ambler, plasterer and slater; and Messrs. Thornton, of Huddersfield, heating apparatus. The contemplated outlay is about 2,750*l.*, which includes land for a new chapel.

Kettering.—On Sunday, the 1st inst., special services were held in the Wesleyan Chapel, Silver-street, in connexion with the opening of the "Tordoff Memorial Schools." The new schools are situate in School-lane, being strongly built with red bricks and white freestone, at a cost of nearly 1,500*l.*, given by the gentleman whose name they bear, who also presented the ground on which the buildings stand. On the ground-floor, reached by a flight of four steps, there are six class-rooms, arranged three on each side of the central passage, leading from the front entrance to the infant school-room, which occupies the back part of the floor, and is fitted with gallery and other conveniences. On the second floor is a commodious room, 60 ft. by 30 ft., which is reached by means of two flights of stairs, one on each side of the entrance. This room is furnished with patent reversible desks, capable of being altered to serve the purpose of tables or high-backed seats, as occasion may require; and the whole building is to be heated by means of hot-water apparatus.

A Rotten Bressumer.—A few days since some workmen engaged in repainting Bouverie House, Rendezvous-street, Folkestone, noticed the "bressumer" supporting the façade of the building exhibited symptoms of decay. The services of Messrs Brooks & Slade were called in, and on examination it was found that the beam was seriously affected by dry rot. The upper part of the building was secured, and the replacement of the bressumer has been nearly completed. Had the rotten timber passed unnoticed for a few months longer a serious catastrophe might have occurred.

VILLAGE HOME FOR GIRLS, NEAR ILFORD.

Sir,—On my return to town a few days since my attention was called to a notice in your issue of the 17th ult. of the new Village Home for Girls which is now in course of erection at Barking-side, near Ilford, under my direction, as architect to the East End Juvenile Mission. The buildings are so well described by your notice that I will not trespass on your space by any recapitulation: I would, however, supplement your notice by informing your readers that the buildings include an infirmary, schools, and steam laundry, that the cottages are built of hollow walls in hydraulic lime throughout to insure dryness, that a deep well is being sunk, and that a complete system of pipe drainage will be laid down with filtered outfall. If any of your readers are interested in the work, I may add that the site is not difficult of access.

Ebenezer Gregg.

NEWBURY PUBLIC OFFICES COMPETITION.

This competition was decided in June last, the successful competitor being Mr. Money, a local man. I shall, therefore, be glad to know when the Newbury Corporation propose returning the plans, &c., sent in competition, and what reason they have in retaining possession of them so long?

I have heard that the motto attached to the drawings of the successful man (Mr. Money) was "£. s. d." Perhaps you, Sir, will know if this is correct?

A Competitor.

EUSTON SQUARE.

Sir,—I beg leave to call the attention of those more immediately concerned to the disgraceful condition of the south side of Euston-square, which has been for nearly twelve months converted into a rubbish-shoot, whereby many valuable trees have been utterly destroyed. Until the last few weeks two or more notice-boards were prominently exhibited, informing the public that a Mr. Martin was contractor for the Euston-square improvements; as they have been removed it leaves the public to conclude that the improvement, otherwise the work of desolation, is complete.

George Bartlett.

PURBECK MARBLE.

Sir,—As I have a large quantity of Purbeck marble fixed that will be exposed next winter to the weather, I should feel obliged if you would allow me, through the medium of the *Builder*, to ask what are the best means I can adopt to preserve the polish on the marble?

Casing with boards, or wrapping up with straw, is not sufficient protection.

Purbeck.

BUILDING SOCIETIES.

Sir,—Can I learn through your columns whether there are any building societies which erect houses for persons undertaking to lease them for a term of years when finished? A friend of mine wishes a house erected for him at Knaphill, near Woking, which he would take on lease for fourteen years.

W. G. Lower.

APPRENTICES.

Sir,—Being an apprentice to a builder, there is one question I should like some of your kind readers to solve: it is, How many hours per week am I bound to work; the men at the shop receiving 9d. per hour, and still working 56½ hours?

An Overworked Apprentice.

STAINED GLASS.

Ellcoughton.—The west window in St. Mary's Church has been filled with stained glass, the gift of Mr. John Hall. It contains figures of SS. Peter and Andrew, together with a small subject from the life of each. It is from the studio of Messrs. Powell Brothers, of Leeds.

Bradford.—An aisle window in St. John's Church, Horton-lane, has been filled with stained glass to the memory of the late vicar. It is one of a series of windows to illustrate the life of Christ. Messrs. Powell Brothers, of Leeds, have done the work.

Shepherd's Bush.—The east window of St. Luke's Church is now filled with stained glass, the work of Messrs. Powell Brothers, of Leeds. The following subjects have been chosen:—Entry into Jerusalem; Last Supper; The Agony; Before Pilate; Crucifixion; Mary meeting Christ after the Resurrection; and, in the large tracery light, the Descent of the Holy Ghost. The subjects are relieved by ruby backgrounds. The ornamental portions are white.

Birmingham.—A memorial window, consisting of two lights, has just been erected in St. Mark's Church, King Edward's-road, by Mr. F. H. Griffiths, in memory of his late parents. The subjects respectively are "The Crucifixion," and "The Descent from the Cross," depicted under architectural canopies. Above the canopies are painted quarries, to form a background, the lights being of considerable length for one subject. In the centre of the painted quarries are treated a monogram in a medallion. The base of the window has in each compartment an angel holding a scroll. The work was executed by Mr. Swaine Bourne, who has also the commission for six stained-glass windows, for Drayton Bassett Church, for Sir Robert Peel, bart.

Books Received.

Practical Guide to Carlisle, Gilsland, Roman Wall, and the Neighbourhood. By Henry Irwin Jenkinson, &c., &c. London: Edward Stanford.

The author hopes that this handbook, accompanied as it is by a map, will enable a visitor to "merry Carlisle" and the adjoining district, to visit the many places of interest in the neighbourhood "without asking a single question, and to feel as though he had obtained the companionship of a friend thoroughly conversant with the neighbourhood." The book appears to be very completely done, and likely to bear out this promise, in the hands of travellers of ordinary intelligence and observation. It is divided into three sections, under the three heads given in the title. The author is a better guide in topography than in æsthetics, however, if we may judge from his quotation of Bulwer's "fustian" (it deserves no other name) about John Martin, on describing Haydon Bridge, where that painter was born. The third section of the book follows the Roman wall in a walk from coast to coast,—a good idea. The author recommends the walk to be taken from west to east, as the traveller then moves from the less to the greater, and his interest increases. Of course, Dr. Bruce's book remains the highest and completest work on the Roman wall remains; but the handbook of Mr. Jenkinson brings a great deal of information into a small and portable compass, and draws largely on Dr. Bruce and other archæological authorities. He contests a point with the former, indeed, in regard to what is generally regarded as the "vallum," and which he considers as being, though made at the same time as the fortification, not literally a part of it, but simply the road which for military purposes would have been necessary along the lines. He gives one or two statements of facts in support of this view, which would appear to have come to light since Dr. Bruce's investigations; for instance, that the Vicar of Gilsland had discovered on the site of the vallum the pavement of a road 14 ft. wide; and at the point where the road, if it were one, would have to cross the Poltross burn, the author observed a bit of Roman masonry, which was discovered by the men when quarrying close by, and which "appears to have been part of the abutment of a bridge." Dr. Bruce, he says, cannot have observed this, as "he remarks that there are no traces of a bridge over the Poltross." This is of course possible, especially as the supposed abutment seems only to have been discovered in the process of some new disturbance of the ground; but only a personal inspection can enable one to adjudicate as to the value of the discovery. The description of the manufacture of the clay cottages in the Drumburgh district, obtained from an old inhabitant, furnishes a curious picture of *al fresco* architecture. The cottages built in this way, of puddled clay with layers of straw at intervals, on a foundation of loose stones, are stated to be warm and comfortable (some are still in existence), and might afford a new hint for remunerative cottage building at low rents; though the picturesque of cottage architecture would hardly be realised, it is to be feared. At many of the farmhouses in the neighbourhood of Alston may be observed relics of the strange customs of an uncivilised age. The cowhouses are below the dwellings, access being had to the latter by stone ladders. In one house at Lonning Head, near Garigill, "the farmer and his cattle enter at the same door, the cattle turning off into the byre, and the farmer turning into the kitchen." This is a true remnant of the old pastoral simplicity; almost a pity, perhaps, that a few such customs should not be kept here and there in odd corners just for their historic interest, and to show how men used to live.

The chief interest of the district, however, is the Roman wall, which one can never see or hear of without a fresh feeling of admiration for the extraordinary people who carried out these great works, as regardless of time and cost as if they were assured that the world was theirs for good, and that a new country, once conquered, was a field for unrestricted future rule to be prepared for and made good by erections and defences, which seemed designed to last for ever, and which at least have long outlasted the use for which they were made. Mr. Jenkinson's book will be worth something to travellers in the Carlisle district, if it only assists them in following and comprehending the remains of the mighty fortification with which the temporary masters of the island designed to ensure their uninterrupted rule, by the simple expedient of "walling up" from seventy to eighty miles of country. Under the modern military system a line of comparatively few forts at intervals would accomplish the object. Before artillery, the thing could only be made complete by building continuously from sea to sea; and that being the case it was done, as a matter of course, and as a simple piece of necessary military strategy, by a people who never did anything by halves. The remark which Scott puts into the mouth of one of his characters, that "our modern labours seem as if constructed out of their fragments," is scarcely an exaggeration.

Papers on Subjects connected with the Duties of the Corps of Royal Engineers. Contributed by Officers of the Royal Engineers. New series, vol. xxii. Woolwich: Jackson & Sons.

In this annual volume we are always sure to meet with papers of practical value and interest, sometimes as much bearing on architects' as on engineers' work. As such we may class the description of the operation of straightening the brick chimney-shaft of the Arsenal Gas-works at Woolwich, attained by a very delicate process of removing piecemeal a course or two of bricks and replacing them by slightly thinner bricks set in sand with only a slight mixture of lime, subsequently raked away till the chimney settled to its bearings on the new bricks, which again were removed and still thinner bricks and thin tiles introduced, the sand filling being removed in the same way, till by repeated operations the chimney had been brought to the perpendicular. A much more elaborate paper, following the above-mentioned, viz., "Notes on Portland Cement Concrete," by Major Macquay, may equally be referred to with advantage by every one concerned in the practical operations of building. The paper is illustrated by careful diagrams. We cannot take the officers of the Royal Engineers as authorities upon architectural design, however; and Major Macquay's statement that concrete dressings have a very good effect with brick must be taken *cum grano*,—they may be made to have a good result, perhaps, but it must be by a special treatment, and not by imitating stone. The paper by Captain Millar on the "Simplification of the Scale of Shade" in map-drawing, and the discussion thereupon, are very interesting in themselves, and not without suggestiveness to all who are concerned in the representation of things, naturally or conventionally, on paper; though of course the considerations here are in direct reference to maps of the face of a country for military purposes. Captain Seddon's paper, on "Our Knowledge of Building Materials, and how to improve it," originally read to the Institute of Architects, is reprinted here. The volume keeps up the reputation of the Corps of Royal Engineers.

Monumental Designs. By Wm. A. Waddington. Published by the Author. Burnley, 1875.

This is a collection of twenty-five plates of lithographed designs for sepulchral monuments, commencing with the simpler form of mere headstones, and increasing in elaboration and scale up to an architectural monument with sculptural decoration. There is no preface or statement of any kind to indicate the footing on which the designs are published, and whether the author is a designer pure and simple,—an architect, in fact,—or whether he is an executor and vendor of monuments. The drawings are very neat, and there is a uniformity of style throughout which indicates that the designer has a definite creed and keeps to it; at the same time the type is not one that we can very cordially admire. It represents that kind of adaptation from French Gothic which has become habitual

here of late, and in which the characteristics of Early French Gothic are exaggerated into a heavy, lumpy, and inelegant style, which has its merit, perhaps, in its capability of being treated so as to procure solidity and massiveness of effect in small things, such as the headstones before referred to, but which becomes less interesting and more cumbersome-looking the larger the scale on which it is applied. Nothing could well be more inartistic than the detail of the angle pinnacles in No. 100, or the pinnacles and spirelet in No. 89. No. 92 is better; but the merit of the collection is in the smaller designs, some of which are good, and all solid-looking,—"too, too solid," in fact; there is cleverness, but want of refinement, in them. There is a good deal of work represented in the collection, which is very well got up.

L'Art: Revue Hebdomadaire illustrée. Nos. 30 and 31. Paris: Heymann.

No. 30 contains a very fine etching by Rajon, from M. Bonnat's portrait of "Mdme. Pasca," in this year's *Salon*. The portrait, which represents the lady full-length in an ample white satin dress, with darker fur trimmings, offers a good subject for effective treatment in etching, from the amount of light in it, which enables the etcher to adopt a free and unlaboured treatment of the principal surfaces. An article on Boulenger gives good and large-size woodcut illustrations of some of his rustic figures. Though in literary and critical power the periodical cannot pretend to rival the *Gazette des Beaux Arts*, its illustrations are of a somewhat kindred excellence, and the advantage of a large page is unquestionable in a publication of this kind. The same number contains an article on the artists connected with *Punch*, with reproductions of some of their works. No. 31 opens with an article on architecture in the *Salon* of the year, by M. de Baudot, presenting nothing special for remark, and not illustrated. A general article on the *Salon* is illustrated by some clever *croquis*, as the French call that rough style of illustration by which they give in a facile manner the spirit of a picture, without going to the time and expense of elaborate engraving. An illustration in this style of Detaille's "Le Régiment qui passe" shows much spirit and character. M. Soldi continues an article on Egyptian sculpture, commenced in a previous number. The larger illustrations in this number are rather deficient in interest, but the publication in general keeps up to its standard.

Miscellanea.

Fall of Churchyard Wall and Railings at Loughborough.—An accident of a serious character occurred on Sunday, the 1st inst., in front of All Saints' Church, Loughborough, by which several persons were injured. Two troops of the 7th Hussars, headed by the band of the regiment, were marched up Church-gate towards All Saints' Church. The street being very narrow, a crush ensued. Opposite the church a crowd congregated, and many persons mounted the churchyard wall,—a height of about 4 ft.,—and held themselves up by taking hold of the upper part of the iron railings, some 4 ft. long. The band on entering the churchyard was stationed near the entrance-gates and played while the soldiers entered the church. This was barely accomplished before a crash was heard, followed by shrieking of women and children. The weight of the people on the walls and their pulling at the top of the rails had had the effect of overhauling the railings, and with them the coping stones for a length of about 45 ft. Persons standing on the causeway were the greatest sufferers, the railings and their occupants being pitched upon them without the slightest warning.

Wells (Somerset).—The little chapel at the northern end of the Vicar's Close is about to be thoroughly restored at a cost of between 600*l.* and 700*l.* This chapel is one of the architectural gems of the city, partly built by Bishop Ralph, of Shrewsbury, in the fourteenth century, and part by Bishop Beckynton, in the fifteenth century. The chapel having fallen into a state of great dilapidation, a proposition was made by a gentleman connected with the Theological College for its restoration. The Vicars Choral, as owners of the chapel, accordingly granted a long lease at a nominal rent, and the work will be begun immediately, under the superintendence of Mr. B. Ferrey, architect.

Surrey Archæological Society.—The members of this society met at Croydon on the 5th inst. for their annual excursion, and proceeded in carriages to Sanderstead Church. A paper on the Manor of Sanderstead was read by Mr. G. Leveson-Gower, the High Sheriff of the county, and the route was then continued to Warlingham Church, which was described by Mr. Ralph Nevill, F.S.A. After refreshments at the Leathern Bottle, the party proceeded to Farley Church, of which Mr. Heales gave a description. Passing through a portion of Surrey and crossing into Kent, West Wickham Church and Manor House were visited, and here they were met by the Archbishop of Canterbury. At Wickham Court, a noble castellated building, Colonel Lennard entertained the excursionists, and gave a history of the mansion. Addington Church and Palace, on the invitation of the Archbishop, were next visited, where papers were read. Returning to Croydon, a collation at the Public Hall, Mr. Seymour Teulon presiding, concluded the proceedings.

Discovery in the Iron Trade.—In one of our iron-making centres experiments of great economic significance are being conducted under the supervision of the senior partner in the firm of Messrs. Rogers, Birchfield, & Co., ironmasters, of Leechburgh, Pennsylvania, who is on a brief visit to this country. Mr. Rogers has applied the natural well-gas of Pennsylvania as a fuel for all the purposes of his ironworks—the heating of furnaces, and the generating of steam; and by the application of blast, injected at the top of the furnace, he has used the principle of the blow-pipe in the making of finished iron, to the conspicuous economy of the working and the improvement of the quality. Mr. Rogers is now occupied in trying to ascertain if the blast can be used in a similar manner in this country, and the experiments made by him have thus far promised equal success in the two countries. If all should be realised which is anticipated, it will be possible to make finished iron of cheap slack instead of costly large coal.

New Franciscan Monastery in Chester. On the 3rd inst., the foundation-stone of a new Franciscan monastery, which is being erected in Grosvenor-street, Chester, was laid by Lord Feilding. The site adjoins the church of St. Francis, which was opened a short time ago by Cardinal Manning. The front elevation is to be of red brick with stone dressings, and three stories high. On the basement there will be small reception-rooms on either side of the main entrance, with dining-room or refectory to the right, and library to the left, and cloister to the rear. The cells, thirteen in number, will be arranged along the corridors in the second and third stories above. The building will cost about 1,500*l.*, of which 400*l.* have been subscribed, and the donors of 25*l.* each will have their names inscribed over the cells. Mr. J. O'Byrne, of Liverpool, the architect of the new church, prepared the plans, and the work will be carried out under the superintendence of Mr. Woolley.

The Borough Surveyor of Kingston.—"No man appears to us," says the *Surrey Advertiser*, "to deserve less the embittered and persistent attacks which have been made on him than Mr. Dunscombe, the borough surveyor of Kingston. With the highest qualifications for his office, and discharging them with the utmost zeal and efficiency, he is an officer whom the borough, or indeed any other in the kingdom, might fairly consider itself fortunate to be able to retain the services of. On Thursday evening, the 5th inst., a further unseemly scene was created by one or two members of the council renewing their absurd protests against this gentleman, but we believe that public opinion will emphatically support the more intelligent members in their determination to put down this feline species of attack on a meritorous officer, whose services are absolutely indispensable to the borough."

Art Union of London.—The exhibition of prizes now open in the Gallery of the Institute of Painters in Water-colours, Pall-mall, is an exceedingly interesting one. In the gallery will also be found Mr. Maclise's original picture in oil of "The Death of Nelson," from which he made the great wall-painting in the Palace of Westminster, companion to that of "Wellington and Blucher," the subject of the Society's last print. The new plate has employed Mr. Sharpe for five years to engrave it, and there is no room to doubt that its success will be at least equal to that of the companion print.

Engineers in Turkey.—Capt. Tyler, Chief Inspector of Railways, Board of Trade, has inspected about 900 miles of railway in that country for the Turkish Government, in company with Mr. Barlow and Mr. Vignoles, in order to report upon the requirements necessary to be executed before they could be definitely received by that Government, and upon the cost of such requirements. That work completed, he undertook, at the special request of the Grand Vizier, in company with Mr. Vignoles, M. Fradet, secretary, and Mr. Payne, to ride through Bosnia and to examine the nature and resources of the country. This journey was performed on horseback, and extended over 19 days, during which about 400 miles were traversed, principally of mountainous country, impassable for wheeled vehicles. To carry tents, cuisine, baggage, servants, &c., upwards of 50 horses were employed daily.

The Yarmouth Aquarium.—The Committee appointed at the recent public meeting to promote the Great Yarmouth Aquarium scheme having ascertained that the amount subscribed outside Yarmouth was only 5,000*l.*, have come to the following resolution:—"That in the opinion of this meeting it is to the interest of the town to promote to the utmost in their power the erection of an aquarium, but that in reference to the question now referred to them it is in their opinion only just and proper that the promoters of the undertaking be requested to show what amount they can raise before the town be applied to for subscriptions." There is a disposition among the Committee, if the shares already taken are increased a certain proportion, to do their best to make up the capital necessary to carry out the aquarium, skating rink, &c., which it is stated would cost 23,000*l.*

Presentation of a Fountain at Birmingham.—The Public Works Committee of the Birmingham Town Council had under their consideration at their meeting on the 3rd inst. an application by Mr. Arthur Ryland, on the part of his sister, Miss Ryland, to be allowed to erect a fountain at the junction of Bradford-street and Moat-row. The application was unanimously granted. It is understood that the fountain will be circular, about 10 ft. 6 in. wide. On each of two sides there will be a large trough for water for cattle and sheep, and the spaces between these troughs will be left open to enable persons to ascend two steps to a circular basin above, into which jets of water will issue. Near to the ground will be troughs for dogs, and the whole structure will be surmounted by an ornamental lamp, and will reach a height of 11 ft. 6 in. The material employed will be granite.

The Advance of Wages in Scotland.—At a meeting of the St. Fergus School Board last week, a letter was read from Mr. William Stuart, builder, stating that, owing to the great advance of wages and material since he had given in his offer for the mason work of the North School, it would be quite impossible to go on with the contract at the present price. He found that 10 per cent. would only be a fair addition, and he would only ask 44*l.* in addition, making the contract price in all 580*l.* Letters had also been received from Mr. Kellman, plasterer, and Mr. Reid, slater, asking certain additions to the terms on which they had offered to do their respective parts of the work of the North School, not exceeding 10 per cent. It was agreed to accept the increased offers.

The Evictions in Spitalfields.—The Great Eastern Railway Company, in evicting from their homes the inhabitants of the dwellings situated in William-street and Fleet-street, Spitalfields, in pursuance of the operations for carrying out the new line, appear to have produced a considerable amount of distress, owing to the fact that in many cases the tenants have been unable to obtain accommodation sufficiently near to their places of employment. Some ninety families, comprising about 800 persons, consisting of costermongers, match-makers, chair-makers, and sempstresses, have been suddenly called upon to remove from their habitations, which they have occupied in some cases for nearly forty years. It has been arranged to hold a public meeting to procure some alleviation of the present distress.

The Town Hall, Brading.—We understand that the inhabitants of Brading are about to take down their ancient Town Hall (which has become somewhat unsafe from age), and rebuild it; and designs for a new erection, after the old style, have been presented to the Corporation by Mr. Varney, of Newport.

Accident at the Dundee New Graving Dock Works.—On the 9th inst., it was discovered that a considerable portion of the floor of the new graving dock had been forced about 7 in. above its centre level, and that water was finding its way into the dock. In order to prevent any serious calamity, it was considered expedient to flood the dock to a slight depth. Mr. Cunningham, the engineer, states that it would not be prudent to make use of the dock until it is strengthened. The whole length of the floor was built in exactly the same way, but the work at the eastern end being recently constructed, was still comparatively green, and yielded to pressure. It was agreed that the opinion of Mr. Leslie, C.E., should be obtained on the matter.

Platform Accident at Scarborough.—Last week a serious accident occurred during the ceremony of laying the corner stones of Sunday schools in the course of erection in connexion with the South Cliff Congregational Church, Scarborough. A temporary wooden platform had been erected for the accommodation of those taking part in the ceremony, and just before proceeding to lay the fifth stone that portion of the platform or scaffolding on the exterior of the building suddenly gave way, and precipitated eight persons to the ground, the planks of which the scaffolding was composed falling upon them. Several of the persons who fell were more or less injured by the fall.

Extension and Improvement of Shoreham Harbour.—The opposition to the extension and improvement of Shoreham Harbour, on a plan proposed by Capt. Wood and submitted to the shareholders and trustees by Mr. W. Hall, has been overcome, and there is now a fair prospect of the Port of Brighton (for such is Shoreham) being placed on such a footing as to be remunerative to its shareholders, and sufficient for the wants of the large populations which it ought to serve. The sum of 100,000*l.* is to be expended upon its extension and improvement under the engineering auspices of Sir J. Hawkshaw. Things having been brought to this point, a Bill will be brought in next Session to effect these objects.

Strome Ferry Pier, Inverness.—The repairing of this massive structure, at which upwards of a dozen men have been occupied for the last seven months, has been completed, under the management of Mr. Alex. Rose, carpenter, and Mr. J. Macdonald, blacksmith, both of Inverness. The old wooden piles, which from a square of 12 in., were reduced since 1870 to a square of 3 in., which tends to show the strength of sea-water here—these old decayed pillars were replaced by seventy-seven new ones of green heart wood from the West Indies, at a cost of 3,000*l.*, this wood being said to be the most durable and hard, next to lignum vitæ.

A Colonial Museum for London.—A deputation from the Council of the Royal Colonial Institute has waited upon Lord Carnarvon, at the Colonial Office, on the subject of establishing a colonial museum in London. The Earl of Carnarvon said he fully appreciated the objects of the deputation, having been in correspondence since he came into office with some of the colonies on the subject. There were difficulties in the way, but he was not without hope of bringing matters to a satisfactory conclusion. He might say that he had already received offers in support of the proposal to the extent of 9,000*l.* or 10,000*l.*, but it was barely more than one-third of the amount required.

Election of District Surveyor.—At the meeting of the Metropolitan Board of Works, on the 6th inst., the Board proceeded to elect a surveyor for the district of St. Saviour, St. George the Martyr, Southwark, and the northern portion of Lambeth. No less than twenty-two candidates were in attendance. The appointment ultimately fell to Mr. Roger Smith. Mr. Selway, as chairman of the Building Act Committee, moved a number of new conditions to be observed, one being that the officer shall keep his district office open daily from ten till six o'clock, and these conditions were agreed to.

Cornwall House of Mercy.—On the 5th inst. the stone of the probationers' ward of this home was laid by the widow of the late Rev. Arthur Tatham, rector of Broadoak and Boconnoc, and Prebendary of Exeter. The ward is built as a memorial of the esteem in which Mr. Tatham was held in the diocese of Exeter, and especially in the county of Cornwall, by his friends.

Little Hulton.—Proposed Sewerage Works.—The Little Hulton Local Board, at their meeting on Monday night, approved of plans submitted by Mr. Williams, C.E., for the sewerage of the district. They also accepted the terms offered by Mr. J. Smith, on behalf of the Bridgewater Trustees, for the lease of a plot of land for 21 years, as a sewage farm. The area of the land is about 18a. 1r. 13p., and the rental which the local board are to pay for it is 5*l.* per statute acre per annum. It was further resolved to apply to the Local Government Board for the loan of 9,000*l.* for the carrying out of the scheme.

Laying the Foundation-stone of the New Masonic Hall, Grimsby.—On the 2nd inst., the foundation-stone was laid of a building to be erected by the Pelham Pillar Masonic Hall Company (Limited), upon an eligible site in Osbourne-street, in close proximity to the Town-hall. The estimated cost of the building, which is to be a Masonic hall, is 3,835*l.* It is said that the progress which Freemasonry has made in the town renders the erection of such an edifice needful.

Opening of the Public Baths, Westbromwich.—The public baths in this town have been opened by Mr. T. Lloyd, a member of the Baths Committee of the Board of Commissioners. The building is adjacent to the new town-hall and forms a detached block. There are two swimming-baths, a first class and a second class. The baths are about 50 ft. by 30 ft., and to each there are about fifty dressing compartments. There are also twelve private baths—eight for males and four for females.

Greenham New Parish Church.—The small Parish Church of Greenham, which had for a lengthened period been a familiar object in the hill-side scenery to the south-east of Newbury, has been razed, the materials being required in the erection of the new structure, the foundation stone of which was laid by the Vicar (Rev. O. E. Slocock). The church will be built in the Early English style of architecture, from the plans of Mr. Woodyear. The contractor is Mr. Samuel Elliott, builder, of Newbury.

Art and Industrial Exhibition at Preston.—An exhibition of works of art and industry was opened on the 9th inst. at Preston by the Mayor, who was supported by the Mayors of neighbouring towns. Lord Winmarleigh, in an address, compared art as it was with what it is, and quoted a number of figures to show the increased value of art productions. Art and science contributed to the intellectual enjoyment and enlightenment of the masses.

Admission to Grosvenor House.—The Duke of Westminster has had a great number of cards prepared, and has sent them to the heads of large establishments, with the view of enabling the *employés* who are engaged, or who take an interest in art industry, to see the pictures and decorations of Grosvenor House. The card admits the holder and four friends on any day in August and September between the hours of two and six p.m.

An Ancient Burial Place.—A correspondent of the *Moscow Gazette* writes from Rjacsan that the workmen excavating ground for the new railway outside that town have uncovered an old burial-place of ancient warriors. Some forty skeletons have been found with implements of war and relics of armour dating from a remote period, namely, swords, arrows, spears, and ornaments worn on the head, made of iron and covered with silver filigree work.

Whitby Sewerage.—At a meeting of the Local Board last week, it was decided to engage Mr. Manser, C.E., London, to undertake the extensive scheme of town sewerage, in which the Board is about to embark. A communication was read from the Local Government Board, sanctioning the raising of a loan of 3,000*l.*, on security of the local rates, for the reconstruction of Spital Bridge, principal and interest to be paid off in thirty years.

The Carmichael Statue, Dundee.—The Committee of the subscribers to this statue having reported to a Committee of the Town Council that they would prefer a site for the erection of the Carmichael statue on the north-east plot of the Albert Institute grounds, the Committee of the Council agreed to grant the request, and have instructed the Town's architect to prepare a block plan of the Institute ground, with the view of regularity in the erection of statues generally.

Architect to the Feckenham School Board.—A meeting of the Feckenham School Board was held at Astwood Bank, on the 4th inst., to appoint an architect for proposed school at Astwood Bank, to accommodate 242 children and teachers' residences; also school at Crabb's Cross, for 350 children and teacher's residences. Several applications were received by the Board, who selected Mr. Ernest A. Day, of Worcester, as their architect.

Plans for the Whitstable School Board Schools.—Several meetings of the School Board were held last week, to examine plans for the erection of Board Schools. About twenty designs have been sent in, principally by London architects. From the number of plans the Board found it a difficult matter to choose the best; but, after due consideration, the design of Mr. Slingsby Stallwood, of Folkestone, was accepted.

The Alleged Bad Foundations of Liverpool Houses.—The Liverpool Health Committee have issued a report on their investigations into insanitary foundations in Liverpool, defending the Corporation from the allegations made by Mr. Alderman Bennett, of Liverpool, to the Local Government Board, to the effect that the foundations of houses in new streets were composed of street refuse and other organic matter dangerous to health.

The Whinbergh School Board.—The Education Department having duly approved of the plans and specification for the erection of a school, and teacher's house attached, as agreed upon by the Board, the formal contract has been signed, by which it is stipulated that the buildings are to be finished by the 1st of February next. The work is now fairly commenced, and the contractor is Mr. William Larner, of East Dereham.

The New Reservoir, Cowes, Isle of Wight. Mr. Richard Barrow, chairman of the Local Board, turned the first sod of the work in connexion with the building of this reservoir on Monday at three in the afternoon, immediately after which the contractors, Messrs. Grice & Woodhouse, set on a large gang of men to commence excavating without further delay, under the supervision of Mr. Manwaring, the engineer.

The late Fire at the Liverpool Landing-Stage.—One of the causes to be tried at the approaching Liverpool Assizes is a claim made by the Mersey Dock Board against the Liverpool Gas Company, the allegation being that the fire which caused the destruction of the stage arose through the carlessness of a plumber who was adjusting gas-pipes.

The Regent's Canal Bridge.—In reply to Sir T. Chambers, in the House of Commons on the 3rd inst., Lord H. Lennox said that steps were being taken to restore the bridge over the Regent's Canal destroyed by the explosion in October last, and since a legal decision had been come to as to who was to bear the cost the works would be proceeded with as fast as possible.

The late Floods.—The inquiry into the cause of the deaths by the floods at Cwn Carn, near Newport, has resulted in a verdict alleging that the Monmouthshire Railway and Canal Company did not keep their reservoir in a safe condition. It is alleged that numerous actions will be brought against the company to recover damages.

Tenders for City Sewers.—The tender of Messrs. Howell & Robson for the diversion of City sewers and the construction of new sewers between the London, Chatham, and Dover Railway and Southwark Bridge, for the sum of 26,500*l.*, was accepted by the Metropolitan Board of Works, on the 6th inst.

New Church at Eltham.—The Bishop of Rochester consecrated a new church at Eltham, near Blackheath, on the 3rd inst. The church, which is dedicated to St. John the Baptist, is from the design of Mr. A. W. Blomfield. The building, which will serve as the parish church, has been erected at a cost of 10,000*l.*

New Church Schools for Accrington.—On the 6th inst. the corner-stone of St. Peter's Church of England new schools was laid at Accrington, by Mrs. Hargreaves, wife of Colonel Hargreaves, of Broad Oak. The schools, when finished, will accommodate 600 children.

Strike of Six Hundred Locksmiths.—On Monday, the locksmiths of Wolverhampton, excepting those in the plate department, began a strike for an advance in wages of 10 per cent.

Convention of the American Institute of Architects.—We have before us a published report of the proceedings of the eighth convention of this Institute, and had prepared some extracts from it for publication. We are forced, however, to postpone them.

School, Todmorden.—The Hebden Bridge sites committee recommended the purchase of a site for a school at Lower Stubbins, to accommodate 500 children, and Mr. John Sutcliffe, architect, was appointed to draw a plan. The recommendation was approved.

Statue to Lord Mayo.—The late Governor-General of India (Earl Mayo), who was murdered by a native, is to have a statue at Cockermouth, with which is memory is associated. Lord Napier and Ettrick will unveil the statue on the 19th inst.

Alarming State of Wem Parish Church. A few mornings since a portion of the stonework of the top window on the south side of the steeple, fell on the roof of the vestry, and caused great destruction to the slates and rafters. The tower is in a very decayed state.

Margate.—At a meeting of the Council on the 3rd inst., it was resolved, on the recommendation of the surveyor, that sea-water should be used for the purpose of watering the roads.

Farming.—Mr. C. H. Birbeck, proprietor of *Berrow's Worcester Journal*, has offered a prize of 100*l.* for the best-managed farm in the county.

The London Roads.—For 11,500,000*l.*, given on p. 680 as the cost of maintaining the roadways, read 1,500,000*l.*

TENDERS

For detached villa residence, with studio, at Hampstead-hill Gardens, for Mr. J. Ingle Lee. Messrs. Batterbury & Huxley, architects:—

King (accepted)	£1,680 0 0

For reinstatement, after fire and alterations, to No. 10, Chenies-street, Tottenham-court-road, for Messrs. Hewetson & Milner. Messrs. Batterbury & Huxley, architects:—

W. & F. Smith (accepted)	£426 0 0

For the enlargement and additions to Sandy Schools, Beds. Mr. John Usher, architect:—

Haynes	£595 0 0
Knight & Boston	585 0 0
Withey	549 0 0
Coban	547 0 0
Cunvin	531 5 0
Twelvetrees	492 0 0

For Messrs. Sutton's new premises, King's-road, Reading. Messrs. W. & J. T. Brown and F. W. Albury, architects:—

Woodbridge	£2,980 0 0
Searle	2,951 14 0
Filewood	2,945 0 0
Barnicoat	2,912 0 0
Woodroffe (accepted)	2,799 0 0

For additions and alterations at Weston Lodge, Putney Park, Surrey, for Mr. S. Merriman. Quantities supplied:—

Hobson	£760 0 0
Adamson	750 0 0
Arlees	731 0 0

For additions and alterations to Avenue House, Church End, Finchley, for Mr. H. C. Stephens. No quantities:—

M'Lachlan & Son	£2,573 0 0
Hobson	2,467 0 0
Ploughman	2,420 0 0
Cooper	2,365 0 0

For new roof over carriage factory, Upper Montague-street, for Messrs. Peters & Sons. Mr. A. C. Cumings, architect:—

Benstead & Sons	£1,370 0 0
C. & N. Foster	1,329 0 0
Mark	1,183 0 0
Harris & Sons	1,182 0 0

For proposed new buildings: comprising two shops in Bell-street, and the formation of a mews with twenty-eight stables and thirteen shops, in Chapel and Burne streets, Edgware-road, with gateway, entrance, and work-rooms over, and at the rear a warehouse building, with private stabling, workrooms, covered yards, &c., for Mr. D. B. Johnstone. Messrs. Bird & Walters, architects:—

Jackson & Shaw	£30,110 0 0
Hill, Higgs, & Hill	29,980 0 0
Macey	29,841 0 0
Ennor	29,367 0 0
Brass	28,882 0 0
Nightingale	28,750 0 0
Lawrence	28,720 0 0
Williams & Son	28,597 0 0
M'Lachlan & Son	28,430 0 0
Cooke & Green	28,373 0 0
Bangs	27,989 0 0
Newman & Mann	27,756 0 0
Adamson & Sons	27,09[illegible] 0 0
Temple & Foster	26,060 0 0
Elkington	25,993 0 0
Mark (accepted)	25,980 0 0

For the erection of new premises, No. 68, Leadenhall-street, for Messrs. W. Morrison & Sons. Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Foster	£1,866 0 0
Ashby, Brothers	1,847 0 0
Scrivener & White	1,752 0 0
Niblett & Son	1,750 0 0
Read & Son	1,747 0 0
Mortar	1,694 0 0
Ennor	1,688 0 0
Sharpington & Cole	1,668 0 0

For the erection of a villa residence, at Sutton, Surrey, for Mr. Arthur J. Allard. Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Mitchell	£3,500 0 0
Peskett & Taylor	3,465 0 0
Sharpington & Cole	3,161 0 0
Hosking, Brothers	3,067 0 0
Legge	3,050 0 0
Jarrett	2,890 0 0

For the erection of a block of school buildings, Kirkdale-road, Leyton, for the Leyton School Board. Mr. J. T. Newman, architects. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Ashby, Brothers	£4,283 0 0
Reid	4,042 0 0
Arber	4,025 0 0
Hosking, Brothers	3,975 0 0
Rivett	3,973 0 0
Sayers	3,718 0 0

For Lambeth Infirmary, out-door labour-yard, and receiving wards. Messrs. Fowler & Hill, architects. Quantities for infirmary by Messrs. Lamb & Church; for out-door labour-yard and receiving wards, by Messrs. Fowler & Hugman:—

Stephenson	£ 8,776 0 0
Crockett	61,945 0 0
Oliver	60,280 0 0
Sherman	59,914 0 0
Howard	58,190 0 0
Crocker	56,565 0 0
Downs & Co.	56,550 0 0
Hart	55,840 0 0
Chapell	55,500 0 0
Nightingale	55,439 0 0
Pearson	55,153 0 0
Hill, Higgs, & Hill	54,400 0 0
Perry & Co.	53,846 0 0
Taylor	53,600 0 0
Tarrant	53,200 0 0

For the erection of new farm-buildings, at Redlands, near Ashwell, Herts, the property of Mr. James White, exclusive of sand and carriage of all materials. Mr. W. Watson, architect:—

Bailey & Son	£2,577 10 0
Sabey & Son	2,540 0 0
Redhouse	2,533 9 0
Dunham	2,377 0 0

For rebuilding the Red Cap, Camden-town. Mr. H. H. Bridgman, architect. Quantities by Mr. W. Barnett:—

Wilson, Brothers	£6,235 0 0
Manley & Rogers	5,884 0 0
Kelly, Brothers	5,730 0 0
Tomms	5,665 0 0
Crockett	5,529 0 0
Elkington	5,510 0 0
Bracher & Son	5,497 0 0
Tarrant	5,460 0 0
Scrivener & White	5,293 0 0
Atkinson & Walker	5,190 0 0

For rebuilding warehouses, Nos. 16 and 17, Windmill-street, Finsbury, for Mr. T. C. Usher. Mr. John Groom, architect. Quantities by Mr. B. A. C. Herring:—

Downes & Co.	£1,306 0 0
Marsland & Son	1,295 0 0
Chapman	1,250 0 0
Langmead & Way	1,237 0 0
Kelly, Brothers	1,220 0 0
Scrivener & White	1,174 0 0
Crabb (accepted)	1,109 0 0

For enlarging and building new school to Wesleyan Chapel, Southall, Middlesex. Mr. Baker, architect. Quantities not supplied:—

Brown	£1,040 0 0
Baker	770 0 0
Gibson	747 0 0
Taylor	694 0 0
Bailey	481 10 0

For the erection of school buildings, with teacher's residence, at Beguildy, Knighton. Mr. E. H. Lingen Barker, architect:—

Jones	£901 0 0
Birrell	898 18 5
Bufton	790 0 0

For alterations and additions to house, in High-street, Barnes, for Mr. W. H. Ratcliff. Messrs. Tress & Innes, architects:—

Tozer (accepted)	£940 0 0

For pulling down and rebuilding stables, &c., at Fairseat, Highgate, for Sir Sydney H. Waterlow. Messrs. Davis & Emanuel, architects. Quantities by Messrs. Linsdell & Giffard:—

Woodward	£1,790 0 0
Newman & Mann	1,735 0 0
Williams & Son	1,680 0 0
Southcott & Co.	1,598 0 0
Holmes	1,484 0 0

For the erection of school buildings, with teacher's residence, at Crugybyther, Radnorshire. Mr. E. H. Lingen Barker, architect:—

Jones	£1,024 0 0
Speake	983 15 7
Birrell	933 13 0
Bufton	800 0 0

For alterations and repairs to the Goat in Boots, Fulham-road, London. Mr. H. J. Newton, architect. Quantities by Mr. Budd:—

Boden	£565 0 0
Godden	550 0 0
Taylor	539 0 0
Shurmur	528 0 0
Hockley (accepted)	518 0 0

TO CORRESPONDENTS.

Erratum.—In "Report of Privy Council on Education," line 29, for "these *ten* years," read "these *two* years."

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Vol. XXXIII. No. 1698. Saturday, August 21, 1875.

ILLUSTRATIONS.

Street Architecture, London: Messrs. Cassell, Petter, & Galpin's New Premises, Fleet-lane (Plan, 752).—Mr. Francis Chambers, Architect 754
St. Sepulchre's, Holborn-viaduct: Tower and Porch, as Restored by Mr. W. P. Griffith, F.S.A., Architect 755

CONTENTS.

Light in London 743
Professional Papers on Indian Engineering 744
Some Notes on the Early Use of Portland Stone and other Building Materials 746
British Archæological Association at Evesham 747
Opening of the Firth Park, Sheffield 748
East Grinstead 748
New Workhouse at Shields 748
Income and Expenditure of the Corporation of London 748
An Architectural Notice of St. Sepulchre's Church, London, and of its Restoration 749
Or San Michele 750
Discovery at Lavenham, Suffolk 751
Sales of Freehold Estates and Building Land 751
A New Model Printing-house 751
The Contract for the Lambeth New Infirmary 752
Warrington School of Art: Proposed New Building 752
On Hammers 757
The Public Health of Towns 758
Underpaid Surveyors 759
Public Improvements at New Maroke 759
Sanitation of Houses 759
Redcar Raceground 759
Decoration of St. George's Hall, Liverpool 759
Competitions 759
London School Board Schools 760
The Bainbridge Memorial Chapel, Byker, Newcastle-upon-Tyne 760
Horticulture at the International Exhibition, Philadelphia 760
Bridport School of Art 760
Cases under Metropolitan Building Act 760
Church Building News 760
Height of Rooms 761
Recovery of Commission for Sale: Thornhill v. Carter 761
The Population of Tyndall's Buildings 761
Miscellanea 761

Light in London.

GOOD roads are, so to speak, the *backbone* of commerce. A town without the solid framework of well-paved streets, to connect its extremities, is a topographical jelly-fish, a mere polype of a city. But not only do roads make a commerce, but commerce, innately *polite*, returns the favour, and makes roads.

Good lighting, however, is as essential to the welfare of a town as good paving. The latter breeds intercourse, the former security of life and property. Without light vegetables grow white and sickly; in darkness *animals* prey. What the stars are to the seafarer the street-lamps should be to the wayfarer,—shining finger-posts, to direct him in his course.

Continuing amongst the marvels of London, we now purpose making a rough estimate as to what is the extent and cost of the entire lighting appliances of this great metropolis,—what the total number of gas-jets fringing its 2,500 miles of streets, like the string of illumination-lamps which border the gravel-walks of the gardens at some suburban place of amusement on a "gala night"; what the united length of the gas-mains buried, like a huge knot of lob-worms, in the soil beneath its thirty-seven millions'-worth of pavement; what the aggregate quantity of gas which is consumed in making the monster capital shine every night, as if it were the decomposing body of some enormous leviathan of the deep, glowing with all the phosphorescence of that wondrous process of *cold* combustion known as "natural decay"; and what the gross cost, or, rather, what the gross amount of money which is *burnt* night after night in the collective street-illumination of London,—ay, burnt as consummately as if the whole of the gold had been blown into the air, in fire-dust, in the form of some brilliant pyrotechnic display.

Let us premise, however, that those who have seen London in the day-time only, with its flood of life streaming through its bricken veins to its restless stony heart, know it not yet in *all* its grandeur and solemnity. They have still, in order to comprehend the multiform sublimity of the great city, to contemplate it by night; under its different aspects. And, more particularly, far off from an eminence—such as Highgate-hill, or Hampstead-heath, on a bright winter's evening; for then, though the stars be shining in all their infinite numbers in the cold clear vault of the heavens above, there is another firmament spread out on the earth below, with its millions of brilliant points of light glittering, like a carpet of constellations, at the feet. Line after line of the long avenues of lamps sparkles in thin fibres of flame, like the trails left by November meteors, cutting and crossing one another till they are lost in the haze of the distance, so that the whole seems as though it were a net-work of fire, or some vast spider's web covered with countless specks of hoar-frost which are all aglow in the rays of the morning sun. Over the brilliant plain, too, there hangs a large lurid cloud, red and luminous as if the monster metropolis were in flames; and looking from afar as though it were one of those huge "fire-mists," or *nebulæ*, out of which the elder Herschel fancied planets to have been consolidated.

Again, it is at night that the strange anomalies of London life are best seen; for it is when the hum of life in the great city grows faint as the murmur of a sea-shell in the ear, and the shops darken, and the glaring gin-palaces thrust out their ragged and squalid crowds to pace the streets, that London puts on its most solemn look of all. On the benches of the parks—in the niches of the bridges—and amid the litter of the markets, or else all along some "hot-wall" at the sugar-bakers', are crowded (we can hardly say nestled), the homeless, shoeless, and penniless. There, on a doorstep, may be, dozes some wretched tatterdemalion child whose day's begging has not brought him enough to pay even for the twopenny "doss" to which his young companions in misery have long since gone whistling off; and where the paving-stones have been taken up and piled high in the roadway, while the mains or the sewers are being mended, and the gas streams from the tall iron pipe in a long flag of flame, there a ragged crowd is gathered round the glowing-red coke-fire—some smoking, and some half asleep as, with out-stretched hands, they stay to warm themselves beside it until the policeman comes round.

Then, as the lamps are put out one after another, and the streets grow steel-blue with the coming light, and the church-spires and roof-tops begin to stand out against the clear sky, with a sharpness of outline which in London is seen only before its three or four million of chimneys have thrown a pall of smoke over the town—then come shuffling and yawning forth the unwashed and unkempt poor; some with greasy wallets at their back, to hunt over each dustheap, and eke out lives which one would hardly think worth the eking, by seeking refuse bones, rags, and bits of old iron. Others, again, on their way to their work, stop at the corner of some street to refresh themselves with a cup of hot coffee, and there they stand grouped round the early breakfast-stall, blowing at the steaming saucerfuls of the mysterious black liquid drawn from the tall tin-cans, which have the redhot charcoal shining, like discs of crimson foil, through the holes in the fire-pan beneath; whilst already the little slattern girl, with her ragged "shallow" slung before her, goes screaming "Water-creeses"! through the still-sleeping streets.

Such is a rough pen-and-ink sketch of the grim and picturesque features of London by gas-light; and now for a jotting, historically traced, of the salient points of the metropolis before gas was thought of.

It was not till just upon 200 years ago that the City was *even partially* lighted with lamps; for in 1694 the "Orphans' Fund" was established, and by the Act of Institution we find that the sum of 600*l.* per annum was assigned towards that fund, as arising from a lease granted by the Corporation of London for twenty-one years, concerning "certayne lyghtes to be kept burning in ye Stretes of ye Citie." The City authorities would appear in those days to have derived a revenue from delegating the privilege of public lighting to private individuals, who must have obtained their remuneration from the householders.

Then in 1716 (on the expiration of the aforesaid lease) an Act was passed ordaining that every citizen should hang out a "lanthorne" before his door, with oil and sufficient cotton wicks to it to burn from six in the evening till eleven at night,—though even this rude form of street illumination was allowed to be discontinued between "ye seventhe nyghte after each and everie new moone, and ye thirde nyghte after ye moone was atte ye fulle"; whilst those who failed to hang out such "lanthornes" on all other nights in each month were to be fined the sum of 1*s.* for each offence.

A few years after this, however, a company seems to have been established which, in return for the munificent stipend of 6*s.* a year, to be levied from each and every householder "in ye Citie rayted for ye support of ye poore," engaged to provide a sufficient number of lamps, and to keep them "ryghte well lyghted" from six p.m. till midnight,—the company undertaking on its part to pay, in consideration of the privilege of taxing the citizens to this extent, the yearly sum of 600*l.* before mentioned to the aforesaid Fund for the orphans.

Nor was it till the year 1736 that the Corporation itself was empowered to set up as many public lights as might be deemed necessary, and to keep them burning throughout the year "from the setting till the rising of the sun"; in return for which boon the City authorities were allowed to levy an annual rate upon each householder, according to the value of his premises. So thoroughly, too, was the work considered to have been done, that for seventy years afterwards, we are told, London was held to be "the best lighted city in all Europe"—though what the state of street-illumination in the other European cities could have been, those who can remember the "darkness made visible" by the oil-lamps burning till the year 1825 in Portman-square may be able to imagine.

Of gas companies the first chartered Corporation is known to have been instituted in the year 1812; but London was not even *partially* lighted with gas till some three or four years afterwards—nearly a century subsequent to the date (1739), when Dr. Clayton is said to have *first* evolved "spirit, black oil, and phlegm," from the destructive distillation of coal—the said spirit being the "inflammable air," as it was afterwards termed, and collected in bladders, so that it might be burnt "by pricking holes in them"; whereas the so-called "black oil" was the coal tar, and the aforesaid "phlegm," ammonia-water.

Still, it was not till nearly the end of the last

"year-hundred" that Mr. Murdock, of Redruth, in Cornwall, applied this same "spirit" to the purposes of illumination, and having collected it in a gasometer, with pipes and jets attached, lighted up his house with the "air"; after which Messrs. Boulton & Watt, in 1798, engaged the ingenious Cornish engineer to illuminate their works at the Soho Foundry, in Birmingham, by the same means. Then the success of the Warwickshire experiment induced Messrs. Phillips & Lee, of Manchester, in 1805, to instruct the same gentleman to set up 1,000 burners in their cotton-mill.

But though, after this, the "inflammable air" gradually got to be regarded as the best means of illuminating large factories, where there was plenty of ventilation, still the noxious smell which accompanied it (owing to the then-defective method of purifying it), the headache and nausea which attended the burning of it in close rooms, as well as the smoke and dirt caused by it (owing to the rude construction of the jets) not only prevented the new mode of illumination being forthwith generally adopted in houses, but the explosive character of the agent caused it to be regarded as of so highly dangerous a nature that it was not till some years later on (1807-9) that it came to be used even as a means of street illumination. For the then-most-eminent chemist of the day, Humphrey Davy, having declared that if public gas-works were set up in London, a mound of earth as large as Primrose Hill would not be sufficient to prevent the danger of the gasometer exploding, it required all the energy and zeal of Mr. Winsor—a speculative German, who took the matter up, and proposed to establish, upon the "inflammable air" principle, a "National Lighting and Heating Company,"—every 5*l.* share of which, it was asserted in the prospectus, would infallibly insure to each shareholder an income of 550*l.* per annum!—it required all the energy and zeal of such a man, we say, not only to raise as much as 50,000*l.* towards so apparently madcap and incendiary a scheme; but, even when sufficient capital had been got together for the purpose, to induce the authorities to allow him to light up Pall Mall with such a foul, fetid, and fatal compound. However, the German had a large stock of patience and perseverance, and at length, in the year 1809, this, the first great street in London, was lighted with gas—to the wonder of all London, and all the world besides. And no sooner was it a *fait accompli* than the new method of street illumination spread—literally like wild-fire—from one parish to another, till, in a few years, the Metropolis really became "the best-lighted city in Europe."

But who thinks of the wondrous novelty of gas now?

Artificial light and heat are such common appliances in these times—from a lucifer-match to that elegant chemical ingenuity, a Döbereiner's hydro-platinum lamp—from a baby's food-warmer to an oxyhydrogen gas-furnace—that those who are nowadays accustomed to play with combustibles almost from their childhood, can hardly understand how difficult it must have been to have kindled the *first* flame; or how fire should in the earliest ages have been looked upon with such sacred awe as to have become an object of positive worship.

Tradition refers the origin of artificial light to a tree having been struck by lightning; but whether this be fable or fact, the power of dispelling darkness by other than natural means must assuredly have been an accidental discovery, rather than an excogitated invention. Savages are known to obtain a light by rubbing two pieces of wood together; but let even civilised people try to produce a flame by such means, and they will soon find the extreme difficulty of the task; so that it is no wonder that in the literally "dark ages," when a light had, by some marvellous means, been once obtained, it should have formed part of almost every early religion to keep it perpetually burning; or that the ancient Mythologists should have instituted a special corps of virgins, called "Vestals," to maintain the sacred lamps, as well as the sacred fire on the altar, in a state of continual ignition. The monkeys in the forests are wont to come down from the trees and warm themselves at the fires which the woodmen have lighted, and left smouldering behind them at nightfall; but never one of the four-handed brutes has been known to have sense enough to put a single log on the burning fagots, in order to prolong the pleasure of the artificial heat.

Light and heat are almost inseparable, and yet there *are* such things as *cold* flames; as in the sheen of the glow-worm and the jewel-like splendour of those winged little *cold* sparks, the fire-flies.*

Still, artificial light is well-nigh invariably the result of rapid combustion; so that with each of the higher degrees of heat some specially-brilliant colour is associated; as, for instance, the bright cherry red, which marks a temperature of 1,200° F.; the glowing golden-orange, which is the hue of heat at 1,700°; the glittering primrose-yellow, which is the luminous lustre of 2,500°; and the dazzling white, which is like a snowball of fire,—the blindingly-brilliant light which accompanies a temperature of 3,300°. Whether what chemists call "*erema-causis*," *i.e.*, the process of burning by *slow degrees*—the gradual oxidation which attends natural decomposition—has any light and colour essentially connected with it human eyes will probably never be able to detect. But, despite the apparent anomalies of phosphorescence, and, so to speak, the "optics of caloric,"—the transparency of certain luminously-opaque bodies to heat, and the opacity of other luminously-transparent ones to it—as evolved by Melloni; all light, natural as well as artificial, seems to be the "necessary consequence" of heat; for astronomers talk of the combustion of the orb of day as if it were an ordinary charcoal fire; and have even begun to calculate how long the fuel in it will be likely to last—the same as, a few years back, geologists were wont to do as to the coalfields of this country. The elder Stephenson delighted to call the warmth and illumination produced by burning coal so much "bottled sunshine"; and there can be no doubt that the heat and light which we now obtain from our Wallsend, Silkstone, and other forms of fossil carbon, were absorbed from the rays of the sun which illumined the vast primæval forests of this island countless ages before the foot of man ever trod the earth. A burning rushlight, a gas-light, and an electric light,—dim as is the glimmer of the first, and blinding as is the brilliance of the last—all owe their luminosity to the same principle, viz., to the incandescence of the tiny particles of carbon which are continually passing, and being rendered red, or white, hot in the course of their passage through the flame. Even so, in the case of the old flint and steel, a *spicula* of metal torn off from the mass, by the force of the collision, or "disruptive discharge," was suddenly raised to the temperature and luminosity of red-hot iron.

And this brings us by "easy gradients" to the improved modes of artificial lighting which are so peculiar a feature of the present age. What the convenience of the modern lucifer-match was in comparison with the old tedious knuckle-chipping process of obtaining a light by means of a tinder-box: such was the advantage of gas relatively to candles. But even candles themselves are, proportionately, a modern luxury—having been first used about the year 1300, previously to which date rushes or splinters of wood, soaked in fat, were the sole means of illumination among the poorer class in this country, whilst the rich lightened their darkness as a special luxury with pieces of string steeped in bees'-wax. Gas, however, as we have said, is an innovation within the last sixty years. So, too, the introduction of lucifers is a novelty. But the accommodation of being able to kindle a flame instantaneously, and at a cheap rate, is only a little younger than that of having one's light and one's fuel (for gas-stoves) laid on like the water to one's house; and not only the entire of this enormous town illuminated with an "air," the reservoir for which may be miles away, but the streets rendered as safe to travel by night, and the shops as showy as they are in the daytime.

The poetical pagans who allegorised the Sun as Apollo, the golden-haired god of poetry and music; as Adonis, the beautiful boy-god, the type of everlasting regeneration, youth, and grace; as Abaris, the undying and unflagging wanderer, who was for ever doomed to make the tour of the earth without getting either bite or sup; as the Ship perpetually sailing in quest of the Golden Fleece; as the Phœnix, the one bird of its kind that was eternally flying through the heavens, and rose continually from its own ashes—what pretty myths would not these pagan poets have created concerning this same wonderful Fire-air of modern times, which is not only a Night-Sun to us, but which, though as explosive as gunpowder, is carried in safety into the midst of our houses, and buried in miles upon miles of tubes under the pavement at our feet.

Some talk as to the cost of lighting the entire metropolis at present we shall reserve for another time.

* There are two artificial compounds notable for this property of shining in the dark, known respectively as "Canton's" and "Homburg's Phosphorus" (from the names of their discoverers); the former consisting of what chemists call the "protosulphide of calcium,"—*i.e.*, a simple combination of sulphur and the metallic basis of lime ("equivalent to equivalent")—and the latter of "chloride of calcium." Moreover, sulphur, when rubbed in the dark on a heated brick, or other substance, which is not sufficiently hot to inflame it evolves an extremely weak blue flame accompanied with a peculiar odour. This flame, however, is not occasioned by combustion, but merely attends the evaporation or sublimation of the sulphur itself; for a cold body held above it becomes covered with "flowers of sulphur," thus showing that no oxidation has occurred; neither is there any sulphurous acid ($S\ O_2$) formed under such circumstances, and that must assuredly have ensued had such flames arisen from *combustion*.

PROFESSIONAL PAPERS ON INDIAN ENGINEERING.

Between the construction of bridges and other works that have no future, and architectural design that has no precedent, the doings of the engineering profession in India, the military branch especially, have frequently presented more occasion for criticism than for congratulation. The engineering college at Rourkee may be looked on as an important agent towards improvement, under its present management, and the papers on professional subjects of recent experience, published* under the editorship of Major Lang, the principal of the college, form an interesting and varied series of records of operations, some of them of rather an unusual kind, and affording instances of the reduction of theory to practice under conditions peculiar to districts only partially cleared and cultivated, and into which engineering operations are, to a great extent, being carried for the first time.

The professional papers issued from the Roorkee College Press are published in a quarterly octavo volume, averaging about 100 pages, with a considerable number of sufficiently carefully executed illustrative diagrams. We have before us the publications for August and November of last year, and February and April of the present year. The papers, in these numbers, include a considerable variety of subjects, from the manipulation of rivers and irrigating canals to the modification and improvement of working gear, both for the engineer and the labourer—the adjustment of levelling instruments, and the contrivance of a wheel-barrow fitted to the bodily capabilities of the "coolie," as distinguished from the "navvy."

The larger branch of subjects, to which we first referred, and which deal with what may be termed the manipulation of the face of the country in regard to the formation of means of communication, and the modification and control of its water-courses, necessarily occupies a considerable place in operations dealing with such great districts of comparatively uninhabited land. It is not too much to say that until a satisfactory basis is laid for a system of roads, and a definite experience gained of the changes to which the face of the country is subjected through natural causes, and the extent to which these can be controlled, the permanent inhabitation, and (consequently) the thorough civilization, of a district, are impossible. If we imagine such floods as have recently devastated some of our agricultural districts, as things possible and probable in those districts any year, with no certain indication of their extent or limits, instead of coming as the unusual result of a very abnormal state of weather, we may realise the condition in which some of the districts of India referred to in these engineering reports may be said to be, and the kind of task which is before the Indian engineer in endeavouring to acquire the information necessary for taking precautions against such invasions of nature, and to develop schemes for ultimately combating them. One of the first papers we come to is a short one by Mr. Burge, resident engineer of the Madras Railway, in which an attempt is made to find and express in a formula "a proportion between the maximum discharges through all bridges of and above 80 ft. aggregate span, on a section of the Madras Railway 110 miles long, and the terms representing the area and shape of the different basins they drain." Of course, as the author remarks, such a formula can never supersede the decision, guided by practical

* Professional Papers on Indian Engineering: Second Series, Nos. 13 to 16. Edited by Major A. M. Lang, R.E., Principal of the Thomason Engineering College, Roorkee. Printed and published at the Thomason College Press. Calcutta: Thacker, Spink, & Co. London: E. & F. N. Spon & Co.

experience, of an engineer inspecting the site and noting defined floodmarks, and the local traditions regarding exceptional freshes. We all remember George Stephenson's laconic remark in reply to the information of the friend who had driven him through part of the district for a new line of railway, and cautioned him against taking the then state of the streams as any indication of their volume of water in winter. "Pooh! didn't I see your bridges?" But where there are not friends or existing bridges to give information of this kind, the case is not so simple. The gist of Mr. Burge's formula, or rather of the reasoning on which it is based, is that all previous rules regard the discharge as proportional to some root of the drainage *area* alone; whereas he considers, judging from his own experience, that the shape as well as the area of the basin is an important factor in the result. "As an exaggerated instance, let a basin be supposed one mile wide and a hundred miles long; it will, with a free outfall, slope the same, and *cæteris paribus*, discharge *per second* a quantity not very dissimilar from that flowing from one of one mile square, though of course the larger area will take much longer to get rid of its flood." For the details of the application of the formula we must refer readers to the publication; it is sufficient to say the required factor of the shape of the basin is embodied with sufficient approximation for practical value in a formula in which the area of the basin in square miles is combined with the length of the main river in miles,—two data easily ascertainable, in most cases, from existing maps. The same volume contains a long and full account of the head works of the Agra Canal, by Major Helsham Jones, R.E., who was engaged on this part of the work. The canal is for navigable purposes, and "is a link in the chain by which it is intended hereafter to connect the Punjáb system of canals with that of the N.W. Provinces." The "Mooltan inundation canals," intended for agricultural purposes, form the subject of another paper by Mr. E. A. Sibold, which gives some information on the political economy, as well as the engineering connected with the subject. The difficulty in arranging the rates for irrigation, and proportioning them among proprietors in many separate villages, appears to have been considerable. "The share system, where a number are concerned, whether worked by the hour, by area irrigated, or by fractional shares in the stream of water, gives rise to too many disputes. Where irrigation is introduced into a new country, a carefulness in granting water-rights, though at the time apparently obstructive caution, will probably avoid future complication." At the same time, the introduction, through European engineering, of systematic irrigation into the poorer agricultural districts of India evidently has its bright side in its important economical and social results.

"The cultivators are, as a rule, hardy, energetic, and manly, and the canal officer who possesses tact and forbearance has little difficulty in earning their confidence and esteem. His canal improvements are so readily and warmly appreciated, that he can scarcely help feeling himself enthusiastic in his work, and he requires to exercise all his conservative feelings to restrain himself from altering too much at one time. Identified as he is so intimately with the agricultural prosperity and very life of the people, and brought into such frequent contact with them, the canal officer is the one to whom, in a failure of crops, the people naturally look for counsel, for assistance, and for relief. The Laugreals, near Mylsi on the Sutlej, once noted cattle-lifters, are now contented and industrious agriculturists. It is, however, a serious matter to develop irrigation in a rainless tract, where a collapse of irrigation works may cause an amount of suffering as disastrous as the Orissa famine."

To make irrigation successful, however, the person in charge must have authority to settle all disputes on the spot. Private (native) enterprise has only been successful, it is stated, in one case, that of a large landed proprietor; whose canals, the author says, will at his death be ruined by the Mahommedan laws of inheritance, which will give rise to litigation, pending the settlement of which the canal will collapse for want of maintenance. The people in general are so well aware of the drawbacks arising from such complications, that in one case of a proposed new irrigation canal of some extent, a number of landowners who would be concerned in its success, volunteered to subscribe and deposit in the Treasury the estimated amount required, on condition that it was made and arranged by the Irrigation Department. "They stipulated that during the first four years of its working, any outsider should have to pay a stipulated sum as compensation to the original promoters of the canal, but that after four years Government should have the right to manage it like the rest of its canals. They calculated on deriving so much benefit from it in this space of time, that it would be worth their while to hold out this inducement to Government to take it up. Tempting as the scheme was, the chances of litigation prevented them from undertaking it directly themselves." Such instances of the important bearing of English engineering and Governmental operation upon the well-being of the country districts of India, coming as they do in an incidental way in the midst of a directly practical paper, are certainly not without interest at present. The faith of the Indian agriculturist in Government seems indeed to be carried a little too far at times. It is hard to convince the people, on some occasions, that an apparent local or temporary loss is to be balanced by a general gain. "They see, in a way, the bearings of the case, but the people have a childlike faith in the idea that Government is willing to compensate with or without cause." The idea certainly has its counterpart among the opponents of public works, new railway routes, for instance, in this country.

Among the papers connected with similar subjects is an interesting account, by Mr. H. C. Graham, of the "Sutlej river-training works at Adamwahan," a report of the means employed to persuade the river to select permanently one of the various channels between which it oscillated, as well with the object of keeping a good and deep channel, as of bringing the current down in a normal direction upon the intended Sutlej railway-bridge, which would be endangered by its frequent changes of course and impact. The means employed were the formation of artificial "spurs" and weed beds in the side channels, in the hope of silting them up before the next floods. We may quote a portion of the description of this rather curious branch of operations.

"It was intended to adopt Colonel Brownlow's system as far as possible; to imitate the growth of weeds, to obstruct the channel without suddenly deflecting it, and thus to silt up the side channels. To effect this it was necessary to provide the weed itself, with means of anchoring it, and of keeping the upper end from sinking through being water-logged. This was done in the following manner:—The 'weed' consisted of a strong rope, or hawser, of moonj, generally 8 in. in girth, and of a length varying with the depth of water and strength of current up to 90 ft., with from two to ten bushes or small trees lashed to it by their butts, the largest bushes being placed lowest. The hawser was made fast to an anchor formed of a netting from 6 ft. to 2 ft. square, of 2 in. to 2½ in. moonj rope, with meshes from 4 in. to 6 in. square; in this loose bricks were built up as closely as possible, from 16 to 65 cubic feet being used in each net. To keep the weed from sinking when the hawser and bushes became water-logged, one or two empty casks were lashed to the upper end of the former. The casks, as a rule, remained perfectly tight, but as a precaution they were wetted daily, where it could be done without much expense.

Besides the above, fixed brushwood and net spurs were also used. The former were simply constructed of bushes and trees laid with their butts up stream, and kept in place by some of the anchors before described, to which they were made fast; as the bushes settled down, others were piled over them. The net spurs were made of netting similar to that above mentioned, in lengths of 100 ft. by from 6 ft. to 20 ft. wide, several being sometimes joined together. A hawser was passed through the lower meshes for the whole length of the net, and another through the upper ones; to the former anchors of the kind already described were made fast; to the latter, casks."

These means appear to have had very quickly the effect of cutting off the current from one of the obnoxious side channels, so far as to cause it to disappear in a space of about two months, from a process of natural silting up. The sections of the river bed at Adamwahan, from the 7th of August to the 12th of October last, given at intervals of a few days, show curiously the exceedingly treacherous and shifting character of the bed, and what the difficulty and risk must be in constructing a railway bridge which should form a secure passage over a river which was thus playing at hide-and-seek with the engineers all the time. From a note appended to the paper, by Lieut.-Col. Peile, R.E., Engineer-in-Chief to the Indus Valley Railway, it appears that the channel has been driven to as favourable a position as could be desired in the neighbourhood of the bridge site; and the result of the season's operations "affords good ground for hope that the oscillations of the river may be restrained with some degree of certainty within fixed limits;" but the whole account, with Mr. Graham's illustrations, affords a curious chapter on some of the difficulties of railway engineering in India. In the paper called "Notes on Bhaugulpore," by Mr. Sibold, and in "Leaves from a Superintending Engineer's Note-book," by Lieut.-Col. Medley, R.E., we find the same source of difficulty dwelt upon; the former especially naming the Kosi river. "Marvellous tales are told of its treachery and violence. Its great floods are probably due to heavy rain in the outer ranges of the Himalayas, as all its floods are preceded by a change in the colour of the water, due to the washings of the low hills, which give warning of a flood at least a day before. Its deposits are not fertilising like those of the Ganges, owing to the much shorter time the silt is held in suspension. On the Kosi, the silt could not be carried more than a hundred miles; on the Ganges it is carried hundreds of miles. The constant changes in the river are due to the configuration of the country, and to the effects of the backwater of the Ganges in flood. A deep, well-defined channel and declivity are both wanting, to give a high velocity to the stream." Water, in short, seems to have a marvellous faculty of getting into the wrong place in India; of appearing where it is not wanted, and being scarce where it is. It is an item in Lieut.-Col. Peile's notes that "the water supply of many towns in the Northern Punjáb is in a very unsatisfactory state. For Pesháwur a scheme is now in progress for leading water from the Bara river, six miles off, through concrete ducts and iron pipes. In Rawal Pindee, the unhealthiness of the city is chiefly attributed to the unsatisfactory state of the water supply. The wells are 100 ft. deep, and often dry up just before the rains,—the people use the water of the Leh Nullah, which, as it is also used for bathing and clothes' washing, is fearfully polluted. A scheme is now under consideration for bringing in a supply from the Rawal Pool, nine miles distant." The prejudices of the natives often prevent them using means within their power for procuring water. In the notes on the Bhaugulpore district, just referred to, it is mentioned that "not a single appliance for raising water by animal power is to be seen in the district, the natives believing that bullocks are killed by walking in a circle."

The directly architectural work which, as our readers know pretty well, comes in India almost entirely under the control of the engineering profession, shows, as illustrated in the present number of the Roorkee publication, some definite attempt at consistency and purity of style. The most important work, in scale, is the proposed new chief court at Lahore (the present one being temporary only), of which we are told that,—

"The general plan was prepared in communication with the Judges, and has been approved by the Government. The style of architecture selected is the Gothic-Arabic [*sic*] of the fourteenth century, of which style Venice affords some of the most splendid and best known examples. It is believed that it is especially well fitted for India, the arcades giving the shade which is indispensable, while at the same time affording ample means for lighting and ventilating, being, moreover, highly ornamental. The great drawback to verandahs in general, at least in the remarkably dry heat of the Punjáb, is that they retain the heat long after the sun has gone down, and when the temperature of the surrounding atmosphere has cooled considerably, rendering it impossible to open any of the doors or windows of the main building which open into them. In the Gothic-Arabic style the open tracery work of the upper portion of the arcade affords ample means by which the heated air, accumulated during the day, can pass off, while the actual protection to the walls of the main buildings is almost as perfect as in the ordinary verandah; the arcades are, moreover, better lighted, and this is a great advantage, when it becomes necessary to light the rooms from the verandahs."

If it is really the fact that the verandah in its usual form shuts in and retains heat to the extent described, after the rest of the atmosphere has cooled, we can only say that the Anglo-Indian house-builders have been an uncommonly long time finding it out, and have gone on with a remarkable perseverance in building in a manner which it appears simple observation shows to be inconsistent with a part at least of the very result arrived at. The employment of the style named here seems a logical and sensible endeavour to combine architectural design with practical suitability for the purpose; and the general elevation of the new court for Lahore (the illustrations of which, by the way, are wretched specimens of architectural drawing and engraving) shows a sensible and purpose-like grouping of the blocks of building, and the plan is a good one; so far as one can judge from the inadequate illustrations, however, it would appear that the details of the "Gothic-Arabic style" will receive little mercy, and that ideas of proportion of parts, and delicacy of detail, have not been developed in the engineering mind of India much more at the present moment than formerly. A more successful architectural structure seems to be the design for the Maharaja's private railway station at Ulwar, which is in the Hindoo style, "the details taken from some of the best known and most admired types." It consists of a central room, with a dome over, and a waiting-room for the ladies and gentlemen of the Maharaja's suite

respectively, opening from this at each side; the dome is to be of brick, faced with marble, with a copper gilt pinnacle, and the sub-structure of the best description of sandstone; the interior finish to be plaster, with an enamelled surface to imitate polished marble (the vices of the West imported, we see, into Eastern architecture), and the floor of sandstone flagging, in an ornamental pattern, composed of pieces varying in colour so as to contrast with one another. It seems to be a tolerably successful revival of the Hindoo style in an appropriate situation. The design is the result of a competition, 500 rupees being offered for the best design; the one selected being by Teekaram, "the head draughtsman in the engineer-in-chief's office of the Rajpootana State Railway," on which the station was to be erected. That is really quite like an English competition. Another item of architectural news, which serves to show that some of our architectural shortcomings are at least not peculiar to Europeans, is found in a paragraph in the "Notes on Bhaugulpore," to the effect that, within the last few years, in that district, a number of temples have been built by the more wealthy natives, and that "some of the designs are very striking; but the effect is spoiled on closer examination, as the bricks are bad, and every ornament and projection is of plaster, like the icing of a Christmas cake. As these temples owe their construction to the desire of the wealthy to outdo each other, and not to a devotional feeling, there is no attempt to ensure permanence." It must be deeply touching to the English architectural wanderer in India to find the practice of his own dear native land thus vividly recalled to his recollection.

Among the papers which describe operations of a special kind, may be noticed one on the "Sleeper Slides in Jounsar Forest," by Mr. C. Bagshawe, assistant conservator of the forests. These were slides constructed to carry down an immense number of sleepers of deodar wood cut in the hill forest of Mundhol, and intended for the Rajpootana Railway. The carriage of these sleepers by hand was found to be impossible for want of the requisite number of men, and would have been a very slow business in any case. The plan ultimately adopted was a trough "slide," some miles in length, 12 in. wide inside, and fed with water at intervals from a stream near which it was carried, and thus to convey the sleepers down with no trouble but launching them at the top and taking them out at the bottom. The plan succeeded admirably, and saved much time and expense. One or two mechanical points in regard to it are worth quoting. The slide was at first 17 in. gauge inside, but it was found that the sleepers, from the play which they obtained from side to side, damaged both themselves and the trough, especially as the bottom of the latter was formed with two slabs, and the middle joint was opened by the battering of the descending sleepers against the alternate sides, while the sleepers were liable to jump out at the turns of the slide. The 12 in. gauge was then adopted, and rendered watertight by the simple expedient of hollowing each edge of the bottom slab about ¾ in., and wedging it up tightly against the side slabs so as to compress the edges against the latter. It was found that the slide required to be fed with fresh water at intervals, as when the sleepers acquired considerable velocity in the lower part of their course they threw the water out of the slide. The trough itself was composed of pieces of the size and scantling of the sleepers, to be eventually taken up, when done with, beginning at the top, and the pieces shot down the remaining length, so that the whole would be eventually utilised as sleepers. One other contrivance illustrated in these papers, we may mention: a very ingenious boom-grating "for stopping floating logs near the head of the Ganges Canal," by Mr. T. S. Beresford, C.E. Much damage has been done to the works on the Ganges Canal by large logs, generally of heavy deodar wood, which come down with the current. More than once a boom was constructed to stop these, but gave way after a very short time, the difficulty being in getting anything strong enough to resist the impact of the logs, sometimes weighing eight or nine tons, without at the same time offering so much resistance to the current as to be weakened and carried away in a little while, or rendered liable to be broken through by a log of unusual size and weight. Mr. Beresford's remedy was the construction of a grating depending into the waterway, fixed in and hanging from a heavy beam above the water. "This beam has its ends fixed into toothed rockers of cast iron, carved to a radius of 2 ft., and these rest and roll in corresponding cast-iron segments, curved to a radius of 4 ft. The grating, which dips a foot or two into the water (depending on supply), is thus free to rock backwards and forwards, but in doing so the whole beam, grating, &c., is lifted through a certain height;" in other words, the action of the rockers is such that when the whole is at its natural centre of gravity, the grating points up stream at an angle of nearly 45°; but when a heavy log travelling down the stream strikes the grating, it forces it into an upright position, and in doing so rolls the rocker up in its seat to the extent of about a vertical foot, in which operation the whole momentum of the largest log likely to come down stream is exhausted, and the grating is strong enough to retain it after the shock of the first impact is thus broken. The diagrams, of course, give a better idea than mere description of this exceedingly ingenious yet simple contrivance.

The peculiar nature of the problems to be dealt with will render these reports of Indian engineering of some interest to all concerned in practical construction, and may offer suggestions for the treatment of problems of a kindred nature in other parts of the world.

SOME NOTES ON THE EARLY USE OF PORTLAND STONE AND OTHER BUILDING MATERIALS.

Limestones and other freestones have undoubtedly been used in this country since structures of stone were first built and lime first burned for building purposes; but at what particular date Portland stone and other cognate oolites were first brought to London for use in public works does not clearly appear. We are told in some of our standard books, historical and technical, in connexion with building matters, that previously to the early years of the seventeenth century Portland stone does not appear to have attracted any attention. Though we are inclined to agree with the statement that the use of Portland stone was not general in London till the time of Inigo Jones, still we have proof that it was used centuries earlier in conjunction with other limestones from France and the South of England. Casting about recently for some early mention of the use of Portland stone by name, we found in the City records "an inventory and valuation of stones belonging to the works at London Bridge, delivered to the wardens thereof by the outgoing wardens" (see Riley's "Memorials"), 24 Edward III., A.D. 1350, in which there is a distinct mention of squared and unsquared pieces of Portland stone, along with other building materials, the list of which, from their then odd names and value, will interest the building reader, and will not be out of place if reproduced. The old Bridge House Court and its adjuncts contained 400 great pieces of oak timber, value 40d. by the piece, making 100 marks; also a pile of timber lying in the garden close adjoining to the water of the Thames, valued at twenty marks. Also timber for fourteen shops, fully wrought and framed for immediate building, 36*l.* [This last item is very suggestive in these days of shop architecture and wood-working machinery.] Also, divers pieces of timber lying in various places in the said court, valued at 19*l.* 6s. 8d.; also 120 pieces of elm for piles, at 2s. the piece, 12*l.*; also, in the Grange, 125 rakes [used for catching the refuse on the Moor Fleete, Walbrook, and other streams], at 5d. each, 52s. 1d.; also divers boards of oak and of "estrichesborde," value 6*l.* 12s. 4d.; also, 57,000 "herth-lathes," value 4s. per thousand, 11*l.* 8s.; also 30,000 sap-lathes, value 2s. per thousand, 3*l.* The total of the items before mentioned being 169*l.* 19s. 1d. The term "estrichesborde" was probably applied to deal boards from the Baltic or the Eastern countries. The "herth-lathes" were the superior laths made from the centre or heart of the timber, and the sap-laths were those inferior ones with the sap in the wood. The inventory continues: "Also 690 ft. of stone of Porteland, hand-worked and squared, as also 1044 ft. of stone of Porteland, not wrought, the total being 1,734, value 5d. per piece, 36*l.* 3s. 11d. [a mistake, 36*l.* 2s. 6d.]; also 600 of coynston [quoin or corner stone], value 5s. per hundred, 40s. [30s.]; also eighteen great stones of Bere [suggested with a good show of reason as being Bere Regis, in Dorset], weighing eighteen tons, value 6s. 8d. per ton, 6*l.*; also a heap of mixed mortar, value 4*l.* 8s.; also 12,000 tiles, value 8s. per thousand, 4*l.* 16s.; also cement for the bridge, 3*l.*; also seven barrels of pitch, value 4s. per barrel, 28s.; also two boats of ragstone value 23s.; also a boatload of chalk value 7*s.* 6d. The total of stone and other items being 59*l.* 6s. 5d." To summarise the other items we find 7½ weys of old lead, valued at 6s. 8d. per wey; 12,000 "plaunchees-nails" (plank-nails or spikes), valued at 4s. per 1,000; 3,000 "dor-nails" (door-nails), at 2s. 6d. per 1,000; 400 large nails for the drawbridge at 12d. per 100. Further on we have mention of "wyndon-nails" (window-nails), valued at 2s. 6d. per 1,000; a stock of "travers-nails" (tree-nails), at 8d. per 1,000; "grapes" of iron (prongs or grappling-irons), at 1d. each. The total value of the building materials in the Old Bridge House, which were all enumerated, was estimated at 250*l.* 18s. 2d.,—a large sum when considered in view of its purchasing power in those days, either in the way of materials or labour. Among the articles not valued, were one great boat, a small boat, a "shoute" or "schuyt" (a timber barge, perhaps), two engines, with three "rammes" for ramming piles, two cauldrons for melting pitch for cement, one presser for fixing, five pots of brass, and four posnets, old and worn out. We consider this inventory of building materials a very interesting one. Long before the above-mentioned period, in 1329, we find in the City records proceedings were taken against Hugh de Hecham, a lime-burner, for extortion and intimidation. The petition that was presented or delivered to the mayor of the city, John de Grantham, is rather long for quotation here, but it commences to the following effect:—"Show unto you the good folks of the Ward of Tower as to the great grievances which Hugh de Hecham, lymbrennere, has committed, in that he caused all those who are of his trade to make oath, that whereas people used heretofore to have one sack of lime for one penny, or at the rate of 3s. 6d. per hundred, at the time when sea coal [sea-borne coal] was selling at 40d. the quarter, now one is not to have of the said Hugh any sack of lime for less than 1½d. or 2d., or else at the rate of 6s. or 5s. the hundred; seeing that the present value of sea-coal for this year is no more than 16d." [by the quarter]. It appears that the redoubtable Hugh succeeded by menaces to prevent the workers of lime of Greenhithe who used to bring lime from that place to London to sell, from coming thither, but those who did come to London with lime, as a forestaller he embraced or made friends with these people, and thereby secured the trade for himself at his own terms. Hugh, however, after due investigation, was found guilty of the charge imputed against him, and it was awarded that he should lose his freedom and go to prison.

In the 30 Edward I., 1302, there is an agreement to indemnify the City against fire, and to roof houses with tiles. One Thomas Bat, before John le Bland, the mayor, and certain aldermen, bound himself, and all his rents, lands, and tenements, to keep the City of London indemnified from peril of fire, and other losses which might arise from his houses covered with thatch in the parish of St. Lawrence, Candelwykstrete, and he agreed that he would have the said houses covered with tiles by a certain stated time. If he failed, the Mayor, sheriffs, or bailiffs of London were to cause the said houses to be roofed with tiles out of the issues of the rents. In the fourth year of the same reign, 1272, we find that playing with tiles was a sort of pastime. From the fatal accident that gave rise to the entry it would appear that the throwing of the tile was a species of a game of quoits, tiles probably rounded for the purpose.

In the account rendered by William Sunnyngge, a carpenter, as to moneys expended by him as trustee on the repairs of a house in the parish of St. Michael, Cornhulle (Cornhill, London) 33 Edward III., 1359, we have a number of very interesting items as to the cost of some building materials and workmen's labour. From this curious document we find that a tiler for two days' wages received 14d., or 7d. per day; his man for the same time, 10d.; for their drink (beer money we suppose), 2d. The cost of 500 tiles was 4s.; a cartload of sand, 4d.; 6 sacks of lime, 12d.; 2 small wedges, the same; 2 slates for a gutter, 2s.; 4 cartloads of stone for the pavement, 10s.; 24 cartloads of gravel, 8s; paviours' work, 6s.; timber and *ponchouns* (puncheons, or posts driven between the small timbers like stays inclining inwards) to mend the walls, 3s.; for 1,500 lathes (laths), 2s. 3½d.; for 1,500 trasson nails (treenails), 18d.; for 1,500 sprigges (brads, or nails without heads), 15d.;

other nails, 4d. A carpenter's wages for 2 days are put down at 14d.; 12 cartloads of *lom* (loam), 4s.; 9 sacks of lime, 18d.; 3 cartloads of sand, 12d.; for one workman's wages for daubing [daubers were layers on of a mixture of straw and mud to a framework, or betimes the layers on of a better compost approaching modern plaster], 9 days at 7d. per day; the dauber's man received 5d. per day. Farther on, in the same account, we find a carpenter's wages charged at 8½d. per day. This was 1½d. per day more; so it would appear that in these early times there was a classification, and no uniformity for bad and good workmen. For soldering a gutter, 12d. is charged; candles used for doing it, 1d. A tiler and his man for one day received 13½d. The next is an entry of some interest: for heightening a room of the said tenement, and for two engines hired for the same for 2½ days, 2s. Now what were the two engines? Were they a species of screw-jack, or some early shoring apparatus for lifting and "needling." Three men were paid for setting piles and for ramming (*rammag*) the same, 2s. Again, we find a carpenter, for 2½ days, 20d.; two carpenters, for 2½ days, at 7½d. per day, 3s. 1½d.; for their drink the same time, 2d.; and for six piles and four bases, 5s. In the foregoing items we find three distinct rates of wages for the carpenters of 1359,—viz., 7d., 7½d., and 8½d. per day. Possibly, the account, though rendered in the above year, extended back over a considerable time.

Reverting to the subject of Portland stone. In these early days its use, of course, must have been limited in London. Taking into consideration the history of Portland Island and the connexion with the church of Winchester, for some time before the reign of Edward the Confessor the island or promontory belonged to that church, we might deduce reasons for believing that Portland, as well as Caen, in Normandy, was resorted to for a supply of building limestone. We believe there is scarcely any mention of Portland Island in our annals before the time of Ingulphus, who lived in the reign of Edward the Confessor, and was chaplain to William the Conqueror. He tells us it was used as a landing-place by the Danes, whence they sallied out against the defenceless inhabitants. In the reign of Edward I., Portland Island was purchased by Gilbert de Clare, Earl of Gloucester, but it has been for a long time back the property of the Crown. The quarries now on the island are either worked by the Government, or leased to private parties, who pay a royalty of 1s. on every ton of stone raised, half of which goes to a trust fund for the islanders. This was a slight compensation for the destruction of the pasture land, and was granted in the time of Charles II., in whose reign the quarries first, to any large extent, were worked, and principally for London building purposes. The qualities of Portland and Bath oolite were, doubtless, well known by that great prelate and builder William of Wykeham, both in his character of Surveyor of Royal Buildings for Edward III., and as a great church builder at Oxford, Winchester, and elsewhere. The introduction of Caen stone into England probably dates from the time of the Norman Conquest, for it appears to have been the favourite material with the architects or workmen who followed the fortunes of William Duke of Normandy and his successors for some time. Its introduction into Ireland is believed to be somewhat earlier, contemporary with the introduction of the Norman and Lombardian styles into the sister kingdom. According to Mr. G. Wilkinson's "Ancient Architecture and Practical Geology of Ireland," limestone has been employed in most of the ancient structures in Ireland, the doorways of round towers and churches showing excellent examples of Norman mouldings and other work belonging to a period anterior to the introduction of that style into England. Sandstone, however, appears to have been a favourite material for sculptured work and ecclesiastical or monastic buildings previously to the introduction of the Early English style, after which time limestone was more often employed. The oolite limestone used in the interior of Christ Church Cathedral, Dublin, presents the appearance of Bath stone; but Caen stone has a very great resemblance to Bath and Cheltenham stone. The cream-coloured oolitic or jurassic limestone in the old interior work of Christ Church Cathedral was either imported from Normandy or this country, for it is not uncommon to meet with the oolitic stone in structures of the eleventh or twelfth centuries in Ireland. Christ Church was founded about the year 1038, and a great portion of the old structure, at least, was built in the Anglo-Norman style. It has been said that the cream-coloured oolitic limestone in the old work of this ecclesiastical edifice is identical with that of the West of England. Among the limestones of Ireland there is but little of the oolitic kind. Mr. Wilkinson gives some instances of the occurrences of the latter variety along the shores of Killala Bay, in the West of Ireland, and this oolitic variety has been used in the construction of the ruined Abbey of Moyne, beautiful still, though in ruin. The sharpness of the sculpture and ornamentation is still retained in the oolitic limestone of this ancient structure.

Portland and Bathoolite, we contend, have been used in these countries for centuries back, and though supplanted after the Conquest by "tender Caen stone . . . more beautiful than durable," to use the words of Sir Christopher Wren, yet through the taste, influence, and energy of Inigo Jones, and the architect of St. Paul's, the use of native limestones, Portland, Bath, and other cognate kinds, for ecclesiastical or civil building purposes, was revived. The former architect repaired a portion of old St. Paul's, casing the exterior and adding a Corinthian portico to the lowest part in Portland stone. St. Paul's Cathedral, and most of the churches built in the reign of Queen Anne, are built of Portland stone, but it is a fact that the stone so much used by Sir Christopher Wren, was superior to the description now used. The quarries that supplied the stone for St. Paul's Cathedral and other buildings erected by the great architect, are not now worked. "It does not pay" modern builders to work or to pay for the working of such hard oolite. Old Westminster and Blackfriars bridges were built with Portland stone, and Thomas Cooley, the assistant of Robert Mylne, the architect of Blackfriars-bridge, used Portland stone in his first great public work, the Royal Exchange of Dublin, for which he competed, and won the first prize, in 1769. James Gandon, his contemporary, or successor, in Dublin, used it in the Custom-house, his additions to the Irish Houses of Parliament, and other public works. Long previously to this, it was used by Sir Edward Lovet Pierce, in the columns and portico of the main building of the Parliament House in Dublin, commenced in 1729. Portland stone is also used in the frontage of some of the buildings of Trinity College, and other later buildings in Dublin. We believe that the columns of the old City Tholsel, in Dublin, built in 1683, were of Portland stone, and, if we are not mistaken, the same stone was used to some extent in the ornamental work of the Royal Hospital, Kilmainham, built about the same period. There appears to have been an interchange of trade in stone between England and Ireland for a considerable period, and of other building materials also. Irish oak was an old importation, and in return for English oolites some carboniferous limestones, including black marble, flagstones, and even burned lime were exported from Ireland to Holland and this country. From the limestone group of Ireland, which consists of three divisions,—the lower, the middle, or "calp" (the common building stone of Dublin), and the upper limestone,—a great variety of building stone is obtained. The calp is liable to rapid decay, but it yields in some localities a valuable hydraulic lime. The lower or upper division, according to Professor Hull, the director of the Geological Survey of Ireland, produces a good crystalline greyish limestone, sometimes dolomitic, and in a few instances oolitic. The carboniferous limestones of Ireland contrast unfavourably as regards colour with those of England, but as a source for the production of marbles it is valuable in an architectural point of view. The steps that formerly ascended to the entrance to St. Paul's were said to be from the limestone quarries of Red-Cow, near Dublin. The black marble or flagging used in connexion with Bird's statue of Queen Anne, opposite St. Paul's, is stated, according to the specification or particulars of that work, to be from Ireland. Ireland still imports a quantity of building limestone, Portland, Bath, or other kinds from England; and the trade in Irish marbles, grey, black, and variegated, is increasing yearly for building and ornamental purposes. Irish granites, Donegal and Dublin, and other coloured varieties, are contesting the field with the Aberdeen kinds. This interchange of trade is also, as in the early days of the introduction of Caen stone, leading to an interchange of workmen. The London limestone stone-carver or mason makes but poor progress in the working of Dalkey, Aberdeen, or Jersey granite, and the artist or artificer that is constantly manipulating the harder material is not fitted to render the delicate touches with chisel and mallet that working in the softer or freer limestone requires, particularly in undercut moulded and elaborate tracery and foliation. With workmen of this class, when for long periods they are engaged on the same material, mind and hand become attuned, so to speak, and there is a conscious *weight* of feeling in each blow they give. Any sudden transition from hard to soft material, from the hardy granite, "the noblest of all the rocks," to the tender Caen or cognate oolites, will not tell favourably for the temper of the workman or his tools, the satisfaction of the employer, or the satisfactory execution and finish of the work. The art of building is an old art, and its history is the history of its architects and workmen, but what should have been learned first of it, as its basis, the geology and structure of our building stones, is being learned the last, to the great injury of architecture as an art.

BRITISH ARCHÆOLOGICAL ASSOCIATION AT EVESHAM.

The Corporation of the quaint old town, Evesham, received, on Monday last, the members of the British Archæological Association with an address, in which they said,—"The Vale of Evesham has long been famed for its fertility and for the beauty of its scenery, and from very early days it has been a busy centre of life. The earthworks and ancient camps of the hills which enclose the vale testify by their number and size to its importance in the eyes of the ancient Britons; the Roman occupation is to be traced on every side by the ruins of the buildings, the names of places, and the large number of coins found scattered over the country; and in the Middle Ages the famous Abbey of Evesham was one of the principal centres of religious life in England. Few neighbourhoods afford the opportunity of a visit to so many sites of abbeys and other spots connected with historical events of great and abiding interest. Our own abbey church has unfortunately disappeared, the little that remains of it, after having been used as a stone quarry for one hundred years, lying buried beneath the ground; but our town still contains many relics of the buildings connected with the Abbey, and these and the site of the battle of Evesham will be visited with interest, as will also the spot where lies the body, though now unmarked by any memorial, of Simon de Montfort, the founder of the House of Commons. If the accommodation which our town affords to visitors is small, we feel that the attractions which it presents to the members of such a society as the British Archæological Association are great indeed, and it will be our endeavour to afford you every facility that lies within our power to make your visit here both agreeable and profitable."

The Marquis of Hertford, as president of the Association, then delivered an excellent inaugural address, in the course of which he said,—"You, perhaps, think I bear too close a resemblance to one of my ancestors and predecessors at Ragley, the first Viscount Conway, who was Principal Secretary to James I., and of whom, in consequence of his not having the gift of a ready pen, the King complained 'that "Steenie" had given him three notable servants—a Gentleman of the Bedchamber, Clark, who could not untruss a point, he had but one hand; a chaplain, Dr. Preston, who could not say prayers, for he scrupled the use of the Liturgy; and a Secretary of State, Conway, who could neither read nor write, having been bred a soldier.' I also have been bred a soldier, and you are now suffering from my education, or rather from the want of it. We are standing on the confines of Worcestershire, Gloucestershire, and Warwickshire, in the picturesque town of Evesham, which has been so well chosen for our meeting, not only for its own intrinsic merits in the eyes of antiquaries, but from its neighbourhood to so many objects of real interest. To-day we shall visit the Abbey, the old churches, and other antiquities, and shall hope to see the grounds and museum of Mr. Rudge, so rich in reminiscences of the famous battle of Evesham of 1255, a subject on which I will not dilate, seeing that we are promised a paper on that historical subject by Mr Herbert New. During this week we hope to visit Broadway, Buckland, Stanway, Hailes Abbey, Winchcomb, Sudeley Castle (where my

ancestor Lord Thomas Seymour, the brother of the Protector Somerset, lived), Wyre, Pershore Abbey, Deerhurst Saxon Church, and thence to Tewkesbury Abbey, several of which interesting places are, as you know, in Gloucestershire." After expressing a hope that the buildings and records of the neighbourhood might derive fresh illustration and additional interest through the visit, the Marquis added, "but knowing we have so many first-rate archæologists like Mr. Evelyn Shirley, of Ettington; Mr. Matthew Bloxam, of Rugby; the Rev. Mr. Brodie; the Rev. A. H. W. Ingram; Mr. Tom Burgess, of Leamington; the Rev. F. Kittermaster; the Rev. Leigh Colvile; &c., and have likewise whole societies devoted to antiquarian research, like the Warwickshire and the Malvern Field Club, and the Warwickshire Natural History and Archæological Society (whose excellent museum and library may be visited at Warwick), I fear that the ground has been too often gone over to afford much novelty during the present visit. The Society which I have the honour of addressing was established in 1843, and bears the name of the original society, from which the Archæological Institute sprang. Perhaps England is rich enough and broad enough to maintain two bodies similarly engaged in the useful pursuit of antiquarian knowledge, but I hope you will forgive me expressing a hope that those who know more about it than I do will, before long, see their way to reuniting the two societies, and so make each more practically and beneficially useful.

Lord Hampton, in an appropriate speech, proposed a vote of thanks to the Marquis for his address. He added that he rejoiced to see the noble residences in this noble land occupied by those of ample means and ability. There was a time when Ragley was only a name; now it was a reality. The Association had done well in choosing Evesham for its place of meeting, and they could not have done more wisely than in selecting the noble marquis to preside over them, and he was glad that he had thought it is duty to accept it.

Mr. George Godwin, in seconding the motion, said the Association were not at all distressed to hear of the number of similar societies now at work, because they recognised in these societies their own offspring. He alluded to the necessity which existed for Sir John Lubbock's Bill, and urged that all local societies should petition in its favour. He also made an appeal in favour of the preservation of Cæsar's camp, at Wimbledon.

The party proceeded to the battle-field in Abbey Manor grounds, which had been thrown open by Mr. Rudge. An obelisk has been erected, bearing an inscription recording how the battle was fought on the 24th of August, 1255, some bas reliefs, and the following lines from Drayton:—

"Great Lester here expired with Henry his brave sonne,
When many a high exploit they in that day had done,
Scarce was there noble house of which those times could tell
But that some one thereof on this or that soil fell.
Amongst the slaughter'd men that there lay heap'd on pyles,
Bohuns and Beachamps, were Basets and Mandevilles,
Hartreshull, Crepping, Despenser, Baliol, Rowele,
Inde, Tregoz, Ernefyeld York, Bermingham, Trossell,
Segrave. And Saint Johns seeks upon the end of all
To give those of these manes their Christian buriall,
Ten thousand on both sides were laid and slain that day,
Prince Edward gets the gole, and bears the palm away."

Here Mr. New gave a brief account of the incidents of the battle.

In the grounds of Mr. Rudge were found scattered many remains of the abbey,—the bases of columns, ugly gurgoyles, parts of niches, tracery of windows, old coffins. The abbot's chair, and two carved figures, from the Bell Tower, stand in the porch of the mansion. The Earl's Well was found to be in a very neglected state.

At a dinner in the evening, given in the Town-hall, the Marquis presided, and various speeches were delivered by the chairman, Lord Hampton, Sir E. Lechmere, Mr. Brock, Mr. Geo. Wright, Mr. Godwin, the Vicar of Evesham (the Rev. J. W. Holland), and others.

Mr. Holland expressed a hope that a monument to Simon de Montfort might one day be erected on the spot where he died, and a subscription to begin the movement was at once offered by a member of the Association.

On the following day, Stratford-on-Avon was visited, and a most enjoyable day spent; papers being read in the evening. Mr. Halliwell-Phillipps, F.R.S., Mr. Thos. Blashill; the Rev. Canon Ingram, Mr. Edward Roberts, F.S.A., Dr. French, the Rev. Dr. Collis, and others assisted in the work, but we reserve particulars for next week. The hotel accommodation at Evesham proved to be limited, but this was supplemented most kindly by a number of the inhabitants. And it deserves mention that the Duke d'Aumale, who has a residence close to the town, placed it at the disposal of the Council, ten bedrooms being prepared in it for their use.

OPENING OF THE FIRTH PARK, SHEFFIELD.

The visit of the Prince and Princess of Wales to Sheffield has been a memorable event, and served to give its teeming population an opportunity of showing that in all that goes to make up good and loyal citizens, they are quite equal to the people in any other town in the kingdom. When Mr. Mark Firth was elected Mayor of the borough, and on a subsequent occasion purchased the Page Hall estate, he announced his intention of presenting a portion of it to the town, and of asking their Royal Highnesses to do him and the town the honour of coming down to open it; and when it was known that the invitation had been graciously accepted and the day fixed for the ceremony, even the most sanguine could not have hoped that the men of Sheffield would, at the sacrifice of so much money and time and labour, produce such a display. The decorations were carried out with commendable spirit. We may mention those of the Lady's Bridge and the Shambles, the cost of which was borne by the Duke of Norfolk. The designs were prepared by Messrs. Hadfield & Son, architects, and the carrying of them out was entrusted to Messrs. Tyler & Co., of Manchester. On the site near Lady's Bridge stood the old Sheffield Castle, and it was attempted to reproduce the massive frowning gateway, with its arches and its towers; its inner walls rising height beyond height, and other surroundings of the ancient site. The chief feature in the design was a three-span arch, stretching from the hotel to the shambles wall, and which represented an old baronial gateway or city bar. The height to the battlements was 60 ft., and to the top of the flagstaff over 100 ft. The centre arch had a span of 20 ft., and each of the side arches was 11 ft. wide. The centre arch was 25 in. high inside; the depth of the arch 27 ft. Springing from the square of the arch were four round castellated towers, 40 ft. high, and 10 ft. diameter, terminating with spiral roof, and surmounted by gilded vanes. In the centre of the four round towers was a square tower, with roof, painted to represent old-fashioned red tiles. Over the centre of the archway, on each front, were placed the arms of the Duke of Norfolk; and on each side of the arch six shields, correctly displaying the arms of De Busli, De Lovetot, Furnival, Nevil, Talbot, and Howard. The structure was strongly built of wood, covered with canvas, and painted to represent stonework. At a distance of 54 ft. from the arch, in the direction of the Shambles, was another tower, rising to a height of 40 ft. above the elevation of the permanent wall. The permanent castellated wall of the Shambles had been cleaned, and on the roof of the Shambles had been erected a platform 5 ft. wide and 300 ft. long. At the back canvas walls had been raised to a height of 50 ft., in two lengths, to represent the interior walls of an old castle. The inner wall had been continued 294 ft., and terminated with another tower of a castellated form, 25 ft. square and 90 ft. high. It had a massive and solid-looking appearance, and formed an appropriate termination to that line of the decorations.

After the arrival of the procession in the park, and the reading of the addresses, the mayor handed to his Royal Highness the deed of gift, by which he dedicates the Firth Park for ever to the public use and enjoyment of the inhabitants of the town. The Prince presented the deed to the town clerk on behalf of the corporation, and formally declared the park to be open. The deed of gift provides "that no political meeting shall be permitted to be held, and no intoxicating liquor shall be permitted to be sold, in the said park, or any buildings or erections thereon, at any time, and no game or music shall be permitted to be played therein on any Sunday or Good Friday."

Fire Brigade Station, Commercial-road. The contractors by whom this building, illustrated in our last, was erected, are Messrs. Stimpson & Co.

EAST GRINSTEAD.

The Rural Sanitary Authority for East Grinstead some short time back advertised for schemes to be submitted to them by engineers for the sewerage of the town, and for the disposal of the sewage, on the understanding that the author of the scheme chosen should be employed to carry out the works.

Schemes from sixteen engineers were sent in for the consideration of the Sanitary Committee, who have decided to recommend the Board to adopt one submitted by Messrs. Smith & Austin, of Hertford. The accepted scheme proposes to sewer the town with small earthenware pipes upon the "separate" system, and to dispose of the sewage by irrigation upon land rather more than a mile from the town.

NEW WORKHOUSE AT SHIELDS.

The Guardians of the South Shields Union have resolved upon the erection of a large new workhouse in consequence of the existing structure being inadequate for the purposes of the union. At the meeting of the members of the Board last week the committee reported that the Ecclesiastical Commissioners had offered a site, ten acres in extent, for 2,200*l.*, which the committee recommended the guardians to accept, and also to authorise them to invite architects to send in plans and designs for a new workhouse to contain 700 inmates, offering for the first selected design 100*l.*, and for the second 50*l.* The recommendation was confirmed, and Mr. J. H. Merton, architect, of South Shields, was instructed to prepare the necessary specifications for the guidance of the competitors. The estimated cost of the building is from 28,000*l.* to 30,000*l.*

INCOME AND EXPENDITURE OF THE CORPORATION OF LONDON.

An account of the produce and expenditure of the City's estates for the year ending the 31st of December, 1874, has been published, under the authority of the City Chamberlain. The document is one of a voluminous nature. The City's receipts are enumerated under various heads, and details are given in every case. Among the receipts are rents and quit rents, 93,510*l.* 17*s.* 7*d.*; renewing fines, 3,438*l.* 13*s.* 5*d.*; premiums for granting leases, 1,200*l.*; Metropolitan Cattle Market, Islington, 37,351*l.* 12*s.* 11½*d.*; Metropolitan Meat and Poultry Market, Smithfield (exclusive of tolls), 40,455*l.* 13*s.* 11*d.*; the total receipts being 313,917*l.* 7*s.* 9*d.* On the same side of the account is given a statement of loans raised, amounting to 263,872*l.* 4*s.* 6*d.*, so that the grand total was 577,789*l.* 12*s.* 3½*d.* Among the charges for expenditure are,—the expenses of the Civil Government of the City, amounting to 49,304*l.* 7*s.* 4*d.*; expenses in relation to Epping Forest, 12,260*l.* 19*s.* 6*d.*; Guildhall Library and Museum, 2,810*l.* 16*s.* 3*d.*; erection of the new library and museum, 6,570*l.* 19*s.* 3*d.*; the total being 274,238*l.* 0*s.* 3*d.*; but, in addition, under the head of loans discharged, are charges relating to the enlargement of Billingsgate Market, 60,034*l.* 10*s.* 11*d.*; western extension of Metropolitan Meat Market, 47,755*l.* 17*s.* 8*d.*, bringing the total expenditure to 554,044*l.* 3*s.* 5*d.*

Disposal of Refuse on Building Sites, Liverpool.—Alderman Bennett, in reply to the report published by the Health Committee under the above title, reiterates his assertions:—He adds, "I wish to say that every statement contained in my two letters to the Local Government Board is strictly correct, the space of land covered, the varying depths of deposits, the description of the ashpit offal, and the class of streets from which sweepings have been extensively used, spontaneous combustion, the number of persons not in the corporation employ earning a livelihood by picking out a portion of the organic matter, and that the Health Committee, owing to frequent complaints, did discontinue carting for a length of time. I will add, the straw taken out of beds when fever in the town was rife, are all matters so easily proved that the Health Committee, in my opinion, would have acted more wisely in admitting all to be true, and defended their course of action, if they could, upon its advantages and merits, if it has any."

AN ARCHITECTURAL NOTICE OF ST. SEPULCHRE'S CHURCH, LONDON, AND OF ITS RESTORATION.

The parochial church is dedicated in commemoration of our Saviour's sepulchre at Jerusalem. It was founded in 1100.

Roger, Bishop of Salisbury, in the reign of Henry I., gave the patronage to the priory of St. Bartholomew, in West Smithfield, who established a perpetual vicarage, until the dissolution of monasteries by Henry VIII., when it fell to the Crown until 1610. James I., in the seventh year of his reign, granted the rectory and its appurtenances and advowson to Francis Philips and others. After which, the parishioners purchased the rectory, and held it in fee-farm of the Crown; and the advowson was purchased by the president and fellows of St. John Baptist's College, Oxford, who are still the patrons. In 1636, this impropriation, held in fee-farm, was worth 440*l.*; and the vicarage, endowed with a third part of the tithes, &c., was worth 179*l.* 14s. 6d. At present, the vicar receives 200*l.* per annum, in lieu of tithes, as settled by Act of Parliament.

This church, says Stow, was re-edified or built about the reign of Henry VI., or of Edward IV. One of the Popbams was a great builder there, namely, of one fair chapel on the south side of the choir, as appeareth by his arms and other monuments in the glass windows thereof, and also the fair porch of the same church towards the south; his image fair graven on stone, was fixed over the said porch, but defaced and beaten down; his title by offices was this,—Chancellor of Normandy, Captain of Vernoyle, Pearch, Susan, and Bayou, and treasurer of the king's household. He died rich, leaving great treasure of strange coins. Sir John Popham was buried in the Charterhouse Monastery, and his monument was placed in the cloister.

The church erected in 1450, consisted of an embattled tower with four octagonal embattled turrets surmounted by octagonal crocketed pinnacles, angular buttresses, &c. Nave, with north and south aisles; chancel, with north and south aisles, separated by screens. Chapel on the north side of the north aisle. Porch, with parvise, and a room over; winding staircase enclosed in a turret. The staircase to the upper room was enclosed by a door on the parvise landing, as well as doors to the rooms. Fireplaces, one in each room. Windows on the south and east sides only. The porch-windows pointed, in three cinquefoil-headed lights with Perpendicular tracery. A niche over the outer doorway containing a stone statue of Sir John Popham. The roof was a low span, with diagonal and angular buttresses, with pinnacles and embattled parapets. The porch was groined with fan tracery, with 17 bosses, at the intersections, consisting of angels supporting shields; one of them has a saltire, one has a crescent and a dagger; on another shield is a fleur-de-lys; on another a wreath of foliage, enclosing a shield, on which is a fess and a bird. On others are foliage, knots, and various devices. There are two small niches inside the porch, over the outer and inner doorway, with kneeling figures. The former contains a male figure with flowing beard, supported by a bird with wings expanded; the latter has a female figure holding a book, and under this niche is an oval shield, with a cross and dagger sculptured thereon, in resemblance of the city arms. On the outside over the doorway was a black marble slab, 4 ft. 3 in. long, by 2 ft. 6 in. wide, and 3½ in. thick. There was formerly an inscription upon it.

The nave and chancel were separated from the aisles by clustered columns with moulded capitals and bases, supporting pointed arches, and surmounted by an open-timbered roof. The windows of aisles and chapels were large and well proportioned, being 17 ft. by 9 ft. 3 in., in three cinquefoil-headed lights, with Perpendicular foiled tracery over. The chancel and aisles comprised three bays or compartments at the east end, separated from the nave and aisles by screens. The east wall has been rebuilt in a slanting direction, depriving the south elevation of one window. The aisles were embattled the same as the porch.

The font, designed by Wren, now stands at the west end of St. Stephen's Chapel; it is octagonal, of Portland stone, and large enough for total immersion, with water-drain stopped up. The font consists of a bowl and stem, moulded; the bowl is curved and convex fluted in the Roman Doric style. The lid is of oak, of an octagonal inverted ogee form, the ornaments on the top and angles being gilt. Spread on the eight sides of the base of the lid is the following inscription in gilt letters:—

"The Native of this Parish,
Gave this Type and Font
In the year: 1670:
The Steward then being
Joh. Clear, Joh. Stringer,
Thes. Barwick, Joh. Dyer,
Josi. Priest, Geo. Reade,
Joh. Blincoe, Rich. Johnson."

At the east end of the chancel, in the floor, is a blue monumental stone to the memory of Captain John Smith, Governor of Virginia, who died June 21st, 1631; his romantic and chivalrous adventures are recorded by Stow in an epitaph, now gone. In the wars of Hungary, in 1602, he in three single combats overcame three Turks, and cut off their heads. For this, and other brave deeds, Sigismund, Duke of Transylvania, allowed him to bear three Turks' heads as his shield of arms. Upon the above monumental stone is sculptured a large shield with three heads.

Stow gives four other monumental inscriptions, which, with Captain Smith's, are inserted in "Maitland's History of London." Stow also says that William Andrew, Stephen Clamparde, Lawrence Warcam, John Dagworth, William Porter, and Robert Scarlet, lie buried in this church.

In the various drawings and views of London before and after the Great Fire, the church of St. Sepulchre can be discerned. In the Sutherland collection, Bodleian Library, Oxford, is a drawing of London in 1543, by Anthony Deu Wyngrerde. A view, drawn by R. West, in 1737, of the south front, was published in 1739.

The church was much damaged by the Fire of London in 1666. The tower, south porch, St. Stephen's Chapel on the north side, and the walls were capable of reparation.

In 1670, a general reparation was made, as asserted, under the direction of Sir C. Wren, but not with his usual good taste.

In 1790, sixty-seven years after the death of Wren, the church was in a great state of decay; in this year the walls of the church were cased with Portland stone, and all the windows were taken out and replaced by others, with plain semicircular heads. The battlements were taken down, and a plain stone parapet substituted. The roof at this time was wagon-headed. The angle piers of the tower being weak, they were strengthened by inserting within the five pointed arches semicircular arches and Bath stone Tuscan columns.

In about 1837 an entirely new roof was erected; these alterations are detailed in Godwin's "Churches of London." The model of the new roof is in the roof of the present body of the church.

In 1859 the large east window was filled with stained glass by Messrs. Lavers & Barraud, at a cost of between 300*l.* and 400*l.*

The churchyard next the Holborn Viaduct was formerly, says Entick, enclosed with a high brick wall, without allowing any footway for passengers on the outside. In 1760 the wall was removed, and the churchyard laid open; and in 1802 it was again enclosed by a dwarf wall and railing. Formerly, a nosegay from this churchyard was presented to every criminal on his way to execution at Tyburn. There is another burial-ground belonging to the parish, given by Sir William Selby; it is situated on the north side of the church.

In 1762, Parsons, the officiating parish clerk of St. Sepulchre's, was pilloried three times in one month, and imprisoned two years, and his wife one year, for the imposture of the Cock-lane ghost, which was managed by their daughter, under their direction.

In a report of the Holborn Valley Improvements, dated November 18, 1872, the line of the Viaduct involved the appropriation of a portion of the churchyard of St. Sepulchre's Parish, and the consequent re-interment of the bodies necessarily disturbed. A faculty was obtained from the Bishop of London for their removal to the City Cemetery at Ilford. A monument to their memory was erected in 1871.

In clearing the ground for the Viaduct, the western front of St. Sepulchre's Church tower was temporarily opened to view. The Estates Committee paid, in 1873, 4,200*l.* on behalf of the parish to the City so as not again to build in front of the church-tower.

On the boarded sides of the walls in the first stage, the bell-ringers' room, are inscriptions recording names, dates of new ropes, &c., from 1741 to 1830.

There were no masons' marks found on the masonry of 1450; but on the Portland stone reparations of 1670 and 1790 were discovered the cross with stopped ends, equilateral triangle, rhomboid, hour-glass form, the letters I, S, and T, the figures 2 and 3, &c. The masons employed on the recent restorations, have used twenty-nine different marks, all being cut in on the bed of the stones. Most of these marks are similar to those set forth in the "Archæologia," vol. 30, p. 113.

In 1873–5, the whole of the upper portion of the tower, from the main cornice, including the parapets, octagonal turrets, and pinnacles, were taken down and rebuilt. The scaffolding was entirely new, 200 ft. high, and erected entirely round the tower. There were 600 poles, containing 16,973 ft. run, at an average cost of 3d. per foot; sixty deals for transoms; 2,088 scaffolding cords, weighing 47 cwt. 12 lb., at a cost of 97*l.* 12s. 8d.; 260 scaffolding-boards, 5,000 wedges, 10,000 nails. It occupied eight men two months in fixing.

The turrets and pinnacles were found to be cased with Portland stone, averaging 8 in. in thickness, and cramped with wrought-iron cramps, 10 in. long, 2 in. wide, by ¾ in. thick, set in about 4 in. from the external air. The core of the turrets and the pinnacles was filled with rubble, and some of the crockets, embattlements, and gargoyles with lions' and other heads, belonging to the Perpendicular church of 1450. The crockets were so slightly worked as scarcely to bear resemblance to leaves. Portions of two finials were found, octagonal, plain, and not foliated. The hole for the vane-staff in one was drilled, and the other punched. Prior to the Fire of London, before the removal of the embattlements on the turrets, they had been partly restored with Portland stone.

The pinnacles and vanes were more modern than the tower. Strype records, "anno 1630, the charge of taking down and new building of one of the great pinnacles of the steeple appeared, by the accounts and bills examined, to be 139*l.* 19s. 4d." The remaining three were rebuilt 1632 and 1633, when "three vanes" were set up, answerable to the former vane on the other pinnacle.

The histories of London give various measurements of the height of the tower. Entick, in 1766, says that "the height of the steeple to the top of the pinnacles is 146 ft."; Noorthouck, 146 ft.; Clarke, 140 ft., &c. These are all incorrect; the height from the ground to the top of the pinnacles, accurately measured before they were taken down, was 152 ft. 9 in., thus:—

	Ft.	In.
Height of the tower to top of parapet	115	0
Height of octagonal turrets from top of parapet	12	6
Height of pinnacles from turrets to caps of pinnacles	25	3
	152	9

Exclusive of the vanes, which were of copper, 9 ft. 6 in. high, and 4 ft. 9 in. long, with a ball and a cross on the top. The parapets were 14 in. in thickness. The width of the tower is 26 ft. 4 in., equal to four squares in height. The internal dimensions are 16 ft. 5 in. by 16 ft. The walls of the tower are 6 ft. thick, cased with Kentish rag 8 in. thick, and filled with chalk; the belfry is internally of brickwork.

The tower originally stood upon large pointed arches, open to the nave and aisles, but now filled up and supported by piers. Upon scraping the tower over the arches the masonry was found to be of Kentish rag, nicely squared and dressed. There are eleven bells, but one is not rung with the rest. Weight of tenor 32 cwt. One bell for many years has announced the executions of prisoners at Newgate.

Mr. Robert Dowe, in 1605, left 50*l.* to the parish for the delivery of an address (printed in Maitland's "History of London") to the prisoners in Newgate, on the night previous to their execution. Mr. Dowe was buried in the church of St. Botolph, Aldgate.

The internal length of the church, exclusive of the tower, is 126 ft., and the width 62 ft. 4½ in. St. Stephen's Chapel is 36 ft. 6 in. by 15 ft.

Let into the Portland stone cornice round the tower was a band or belt of wrought iron, 5 in. by 1½ in.

The original floor of the tower was 14 in. below the present level. Several ornamental encaustic tiles were found belonging to the floor of the original church. The turret staircase begins in the south-west angle; fifty-six steps, with 8½-inch risers, conduct to the first stage, or floor; crossing the floor to the staircase continued in the north-west angle, thirty steps lead to

the second stage; crossing this floor to the north-east angle, thirty-one steps lead to the belfry-stage, and forty-one additional steps conduct to the lead flat of the tower; making a total of 158 steps. All the doorways of staircases have Tudor arches. The ceilings of turret staircases were of stone, and groined. In the south-west turret were formerly two openings: one a hagioscope looking into and through the tower, and the other was a doorway leading to the west window.

All the windows of the first, second, and belfry stages were pointed in two heights, with cinque-foiled heads. The tracery in the window-heads was panelled and trefoiled. An original window was found in the first stage, west side; and in the scond stage, south side. This latter was discovered on removing the clock. The clock front was of Farleigh Down Bath stone, in good condition, set in Roman cement. It had a crown in half relief on it. The tablet had an architrave and pediment, supported by trusses; on the architrave was [illegible] on the south side, by the turret-door is the [illegible]w-bell. And in the angle of the north wi[illegible]dow is a lead [illegible]rinal inscribed with

17 S P S 85

The parapets are now embattled, and pierced with cinquefoil-headed and quatrefoiled openings. The turrets are 7 ft. in diameter, panelled in two heights, cinquefoiled, and embattled, with bosses at the angles 1 ft. in diameter. The pinnacles are crocketed with finials and vanes. On the main cornice are twenty-eight bosses, 1 ft. 6 in. in diameter. All the bosses, sixty in number, are boldly carved with the heads of lions, fleurs-de-lys, roses, Tudor flowers, foliated heads, and cruciferous and other flowers; no two are alike; they have been sculptured from my detailed drawings, and selected from buildings in this country, of the fifteenth century date. The weight of the four turrets and pinnacles is 280 tons.

The total height of the tower to the top of the pinnacles, as restored, is 149 ft. 11 in., exclusive of the vanes, which are 10 ft. high. The original windows of the tower were of Kentish rag, 12 ft. by 5 ft., the tracery being of Ketton stone. After the Fire of London, or just before, plain pointed windows in two lights were inserted, without tracery or mouldings, all being of Portland stone. The central mullion was retained in its position by a wrought-iron bar passing horizontally through the centre of the mullion, 1¼ in. thick, flat, and 1 in. in diameter, circular through the window openings, and at each end in the form of a spade jagged on the edges, and inserted in each side jamb of the window openings. These iron bars were much corroded.

Of the west window, excepting the internal jamb mouldings, the original opening, 17 ft. 6 in. by 9 ft. 7 in., only remained. A new window is now inserted, in four lights, transomed, with cinquefoiled heads. Perpendicular foiled tracery fills the window-head. The west windows of the north and south aisles are new, in three lights, cinquefoiled, with tracery in heads.

The west doorway, of which much remained, was entirely of Kentish rag. This has been entirely restored; the label is in one stone, 11 ft. 6 in. in length.

The whole of the tower windows are new, in two cinquefoil-headed lights, with transoms and tracery as before, surmounted by finials, and crocketed labels, with foliated bosses or terminals. The external facing of the tower was principally of Kentish rag. The buttresses have been repaired, and gablets 6 ft. by 4 ft. added, with finials, crockets, and foliated bosses.

All the remains of the Gothic churches in London and Westminster which were damaged by the Fire of London were barbarously spoliated by Sir Christopher Wren, and however excellent his geometrical knowledge of construction and of Italian architecture may have been, he was grossly ignorant of the details of Gothic architecture.

To return to the porch; the walls, 3 ft. wide, were found to be in a ruinous state, and veneered or cased with Portland stone 1½ in. thick. The pinnacles, embattlements, niche and statue of Sir John Popham, were all swept away, and a semicircular-headed Italian window, with a bull's-eye window substituted; and the beautiful example of fan-tracery, and its bosses, nicely (!) compoed into an ignorant "restoration."

The porch as now restored has an entirely new circular Portland stone turret-staircase leading to the lead flat. The embattlements, all the pinnacles, the outer doorway, and the whole of the windows are new, all their features being restored. The bosses or terminals on the pinnacles are now decorated with the leaves, flowers, and fruit of the bramble, ivy, maple, oak, passion-flower, shamrock, whitethorn, vine, &c. There are two rooms over the porch, 18 ft. 6 in. by 12 ft. The room immediately over the porch is arched in 9 in. brickwork, with stone ribs. The haunches are filled with earth. The room is 9 ft. 10 in. high. It is to be regretted that an oriel window has been substituted for the niche and statue of Sir John Popham over the outer doorway. The latter were restored in the contract drawings and included in the restoration, but, notwithstanding my protest, the churchwardens insisted upon having an oriel window, which however well adapted for gentlemen's halls, is entirely out of character in a porch. The statue of Popham, similar to "Old London stone," formed one of the landmarks of the City, and would have vied with the statues recently introduced on the Holborn Viaduct.

The Council of the "London and Middlesex Archæological Society," usurping beyond its orthodox functions, submitted plans and sections for the re-modelling of the body of the church, and urged that "it would be undesirable to make the church itself to match the old tower and porch in style of architecture, for several reasons; but principally because the interior is more than an average fine specimen used by Wren in rebuilding the City churches after the Great Fire." The incapacity of an "Archæological Society" to express an opinion on architecture *per se* was never more apparent than in the present instance. Now, in what does this "more than average fine specimen of the style" consist? All the remains of Wren's work are a dozen *quasi* Doric columns, and the altar-piece. All the windows are the old Gothic openings, with semicircular heads added, without a single moulding; the whole of the roof over the entire body of the church was put on in about 1837, and consists of lath-and-plaster groining, with doves, &c.; the springing of the arches rising from the centre of each window opening!

The tower and porch having been restored, there can be but one opinion respecting the body of the church, viz., to restore it to its original state; all the old walls and finely-proportioned window openings remain, including St. Stephen's Chapel.* An open-timbered roof, and the clustered columns in their original positions, would complete the restoration of the nave and aisles as formerly. In 1836, 12,000*l.* were asked for, to restore the nave of St. Saviour's Church, Southwark, and in 1839 a tender was accepted to destroy it, and to build a new nave in its place, at a cost of 8,000*l.* Upon the completion of the building it cost 12,000*l.*, being the same amount that would have restored the ancient nave in its original entirety.

The whole of the stone used in the restoration of the tower and porch was from the Ancaster stone quarries, viz., the fine white and crown freestone, weather bed, laid on its natural bed. All the mullions of the windows are of Ketton stone, and glazed with lead quarry lights by Mr. Denton. All the carvings were executed by Mr. Hibbins. The vanes were made by Messrs. Hart & Son. The contractor was Mr. Lidstone, and the clerk of the works Mr Mallcott. The total cost was 4,726*l.* The whole of the works have been executed from my designs and superintendence.

W. Pettit Griffith, F.S.A.

* The view given on p. 755 shows the body of the church as suggested to be restored.

OR SAN MICHELE.

Or San Michele is like no other church in Florence. It is like no other church the world over. It was never intended for a church, but was built by Arnolpho, by order of the Signoria, for a corn-exchange, as we should call it. Taddeo Gaddi turned it into a church, and it was still further altered at a later period by Orcagna. It makes but a small church, though it is a very lofty building, but there are two other floors above the church, which only occupies the ground story. In Or San Michele you breathe the atmosphere of ancient Florence, which you cannot do in the neighbourhood of the railway-whistle and the brand-new houses of the English and Americans. Among all the old places in the old city none is less changed than Or San Michele. It stands in the busy Via dei Calzajuoli, and thus occupies a position between the two most famous piazzas of the city,—the Piazza della Signoria and the Piazza del Duomo. On its western side is the ever noisy Murcato Vecchio, and scarcely more than a stone's throw from its eastern front are the fragments of the most interesting house in all Florence, that of Dante.

The building is almost square. The ground-story is divided into lofty arches, which spring from massive piers of masonry, thus preserving the tradition of the old Loggia. These arches that were once open to the floor within, are walled up to the springing-line of the arch, and the head of each arch is filled with unusually rich geometrical tracery and stained glass. In the centre of every pier, at about a man's height from the ground, there is a white marble niche, with an overhanging canopy, built into the thickness of the pier. Each niche has a bronze statue in it, or more than one. Donatello's St. George is the only marble statue in the series. The walls around are black and stained with the rain and smoke of centuries; but the niches glitter with the whiteness of Carrara marble and gold mosaic. Ages ago, when the Arti Maggiori and Minori were flourishing and rich corporations, they dedicated each a statue to their protecting saints. These money-changers and silk-mercers, farriers and butchers, selected their men of art, as your noble connoisseurs might do now, and drove hard bargains with a Giovanni da Bologna, a Ghiberti, a Donatello. The butchers gave a St. Peter,—a grand old fellow, book in hand. The dust of ages lies thick upon the folds of his robe. Above the pointed gable of his niche are the arms of the guild in a circle of Robbia ware. The shoemakers gave a St. Philip. The joiners, the stonecutters, the masons, and the smiths clubbed together and filled one niche with four saints, who can scarcely find standing-room. On the base of the niche their various pursuits are carved. The mason builds his wall, the joiner smoothes his wood, the carver carves his statue. This is a glimpse into the workshops of five hundred years ago. The armourers and sword-makers dedicated a marble St. George,—the famous St. George of Donatello. There is a plaster cast of this statue in the South Kensington Museum, but perched as it is on a couple of exhibition-cases and divorced from its beautiful niche, it has little of the effect of the famous original. The youthful saint fills his niche with an air of splendid alertness. He is bare-headed, and wears a cuirass and greaves. With his left hand he grasps his red-cross shield. The marble canopy above him is carved in many intricate ornaments, and little angels spread their wings and fold their arms upon its pinnacles. The money-changers gave a St. Matthew. Their arms are conspicuous above the niche,—a shield thickly sown with golden florins. The Guild of Wool dedicated a St. Stephen. The blacksmiths gave a St. Lo. The furriers gave a St. James. The rich Guild of Silk gave a St. John. The justices and notaries gave a St. Luke. These statues are a series of ideal forms, of varying merit no doubt, but yet the work of mighty artists, and the gifts of mighty traders. The stone blackens and crumbles away by degrees. The carved marble is eaten into by wind and sunshine, but these graven apostles will outlast the very rocks. Long ago, when the church was still a loggia, and busier than the busiest of the remaining loggie are now, there was a wonderful Madonna upon one of its piers. She was a compassionate saint; she wrought miracles,—at least, everybody in Florence believed that she did. The grandest artist of the time was commissioned to build a shrine for her, which is the glory of Or San Michele to-day. This tabernacle is a jewelled pyramid that flashes its hundred rays through the dimly-lighted church. Open arches on three sides, springing from the angles of the shrine, support a roof, vaulted below, but domed on the exterior, that overshadows the altar within the parallelogram. The picture of the Madonna is placed over the altar, surrounded by worshipping angels, bearing lilies and palms, and musical instruments. Numerous heads of the apostles and seers lean with their mottoed scrolls from the arches and piers. The history of the Madonna is carved on the base. The marriage and annunciation, and the death and the assumption, the birth of the Holy Child, the visit of the kings, and the presentation in the Temple. These are all sculptured in the creamy marble, soft and shadowy with age, and the blue and rose, and amber and gold, of mosaic form a border about them. Devotion, Temperance, Perseverance, Humility, Truth, Docility, are the virtues that stand at the angles of the piers.

This is the Capo d'Opera of Orcagna, in marble. Through ten years he wrought with his own hands in the carving of the bas-reliefs. The cost of the entire work was 86,000 gold florins. Before leaving, the visitor should seat himself for a moment on one of the benches that are placed parallel with the sides of the shrine, and look through to the painted window beyond. By so doing the Tabernacle receives its glorification, and is a truly beautiful vision. The arches appear to enclose the richest, most mysterious colours, the very splendour of the setting suns. Eternity is typified in the marble calm of the shrine, and life, and its mystery of sadness and fugitive brightness, in the colours of the window. All the windows, with one or two exceptions, still retain their ancient glass. Although the area of the glass bears but a small proportion to the size of the space between the piers, the windows are by no means ineffective. Each one glows, jewel-like, in its setting of grey wall and shadow. S. D.

DISCOVERY AT LAVENHAM, SUFFOLK.

The Suffolk Archæological Institute have had an excursion, and, amongst other papers laid before the meeting,

Mr. Dewing read the following notes relative to a recent interesting discovery at Lavenham:—A short time ago Professor Churchill Babington drew my attention to the discovery of an early kiln or oven at Lavenham, intimating that from the description he had received, it might turn out to be the work of the Romano-British period. This discovery was made upon the property of Mr. William Biddell, of Lavenham Hall, and by his kindness I had an opportunity of seeing it. The kilns or ovens were found when digging for gravel in a pit close to Lavenham Hall, and near the site of the house of the De Veres, the remains of which are still visible in front of the present hall. Entering the gravel-pit from the road, the kilns are seen in section on the opposite side, and a stranger may well be forgiven if his first impressions are in favour of Roman work. The kiln is double, like two wagon-shaped steam boilers lying side by side. In fact, the section is very much that of a wagon-boiler. A single course of hard floor-bricks is laid upon the surface of the gravel, on a thin bedding or layer of clay, which the heat has rendered hard and friable, subject to the original deposition. Over this floor two barrel arches are turned, 3 ft. wide by 2 ft. 3 in. high, the crown of the arch being somewhat depressed. The depth of the kiln and the length of the barrel are not less than 12 ft. I have said that the floor is of hard bricks. These measure 10 in. by 5 in. by 1½ in., are unglazed and more burnt on one surface than the other from the heat of the kiln. The arch itself is entirely formed of flat roofing tiles of a red coarse make, averaging, I should say, 6 in. square, but as I could not extract a perfect specimen, I am not quite sure about the dimensions. They are ⅝ in. to ½ in. thick, and average 14 courses to the foot, so that the layer of clay (for the tiles as well as the floor bricks are laid in clay) is nearly as thick as the tile. The haunches of the arches are filled in with a soft red brick, measuring 9 in. by 5 in. by 2½ in. The surface of the ground around is covered by broken pieces of tiles, and below the surface may be traced a layer of shells, the whelk and oyster predominating. I found no pottery, but had little time for search: one piece of glazed tile I picked up, but I think it accidental. The Roman theory of the origin of the oven I must think untenable. The character of neither the bricks nor the tiles supports it; nor does the form of the kiln agree with such accounts of Roman kilns as I am acquainted with. On the other hand, the bricks are not modern. The tiles might pass for modern flat roofing tiles, but the hard bricks are certainly not modern. Similar bricks of modern make measure 9½ in. by 4½ in. by 1¼ in., whereas these measure 10 in. by 5 in. by 1½ in., *i.e.*, they are longer, wider, and thinner than modern-made hard bricks. At first I thought, led by the large quantities of broken tiles lying about, that the kilns might have been connected with tile-making. But the same thing occurs elsewhere in the neighbourhood, and the kilns do not appear adapted either by their form or by their heating powers, for the burning of tiles. It will be observed that there is no furnace nor apparent means for heating these kilns; we are, therefore, driven to the conclusion that they must have been heated somewhat after the manner of a modern baker's oven—by wood. Some years ago a kiln was discovered at Malvern, which was so far similar to these that there was an aperture for the escape of smoke, and it was evident from the remains that charcoal had been used for firing. Charcoal was, therefore, in all probability, the heating medium at Lavenham. It would seem not unlikely that these Lavenham ovens were used in the manufacture of the soft common pottery which satisfied the wants of the district about the seventeenth century. If so, it is remarkable that the kilns differ in form from those in use among the early Staffordshire potters, which were of a round coped form, about 6 ft. wide and 8 ft. high; were it not for this difference I should have put forth this suggestion with some confidence, as it is borne out by the name of the Potters' Field, which the place bears. As it is I hesitate, and leave it to others to supply my deficiencies.

Professor Babington, being called upon by Mr. Dewing, said he could have wished to say nothing about the matter until he had had an opportunity to make more accurate investigations, but he thought from their surroundings,—pieces of pottery, &c.,—that the remains spoken of by Mr. Dewing were unmistakably Roman. The arches seemed to be Roman, and the occurrence of whelks with oysters, in thick layers, encouraged this presumption, for these were commonly found about Roman villas. The professor produced a fragment of the neck and lip of a vessel picked up on the spot, which he thought might have been the site of a Roman villa, and of a manufactory of pipes or something else at a later period. The structure of the tiles did not seem to be Roman, and the whole matter required further investigation. He was inclined to think they were hypocausts.

SALES OF FREEHOLD ESTATES AND BUILDING LAND.

On the 10th inst. Messrs. Farebrother, Clark, & Co. offered for sale at the Mart, Tokenhouse-yard, several valuable freehold estates, situated in the counties of Middlesex, Hertfordshire, and Wiltshire respectively, the estimated value of which was upwards of 200,000*l*.

The first lot of property submitted was a residential estate, together with a quantity of building land, situated near the village of Great Stanmore, Middlesex, containing an area of a little more than 11 acres. The property was stated to be about three miles from the Harrow Station of the London and North-Western Railway, and within two miles of the Edgeware and Highgate line, and was further described as being well adapted for building purposes, in consequence of additional railway communication which would shortly be opened out, bringing it within easy access from the metropolis. The upset price was 4,000*l*., and the property was sold for 4,350*l*., being at the rate of about 400*l*. per acre.

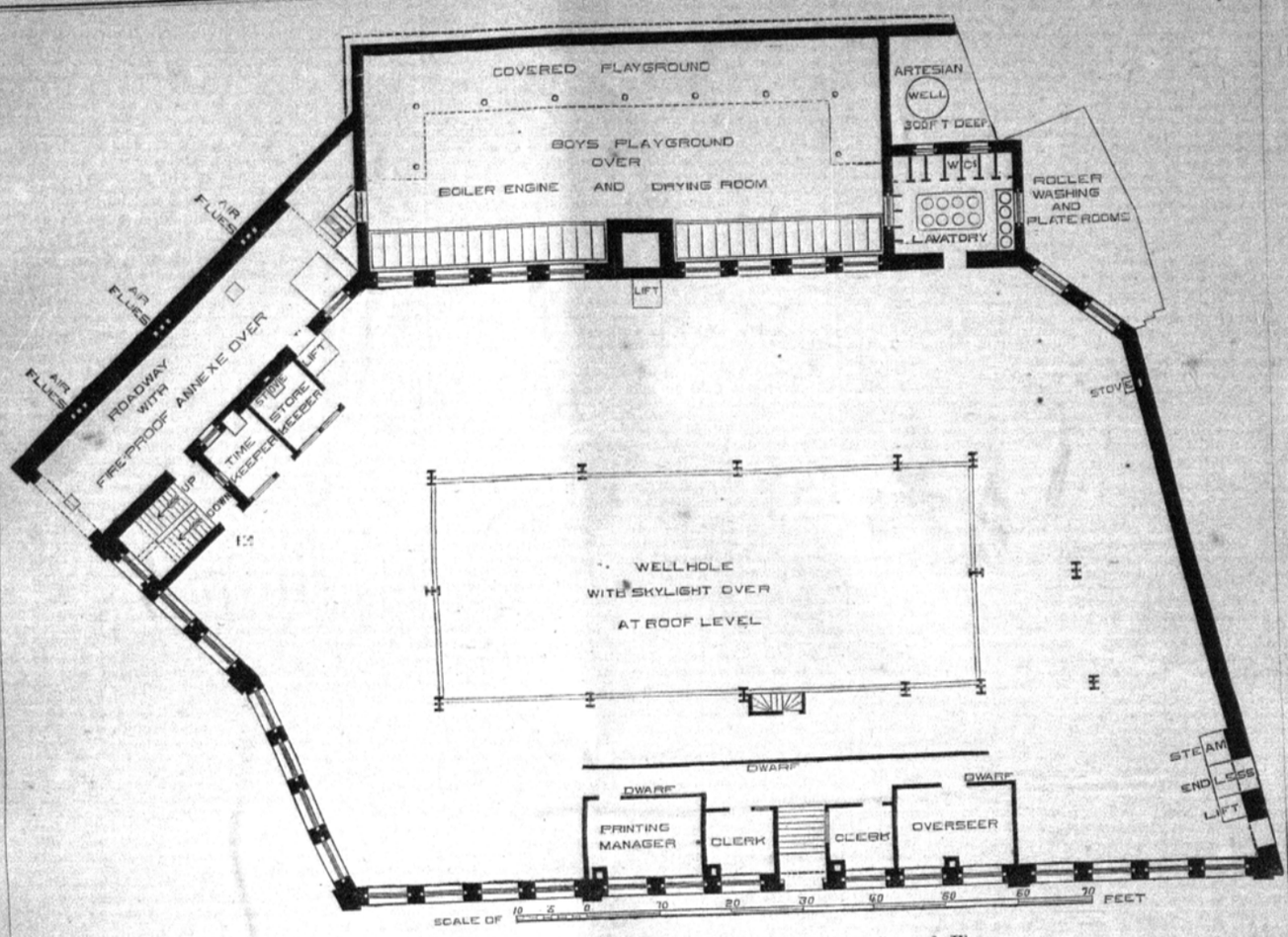
A number of extensive estates in the parishes of Aldbourne and Wanborough, Wiltshire, containing in all 2,330 acres, were submitted to competition. These estates were in five lots, the several lots containing respectively 790 acres, 537 acres, 184 acres, 390 acres, and 425 acres, the aggregate annual rental being stated to be 2,054*l*. The first lot, containing 790 acres, was put up at 13,000*l*., the biddings going on by advances of 100*l*. each, until the property stood at 16,000*l*., at which sum it was knocked down. The first offer made for the second lot, containing 537 acres, was 12,000*l*., and the property was ultimately sold for 13,500*l*. The offers for the three next lots not reaching the reserve, they were withdrawn. The sum realised for the lots sold amounted to about 25*l*. per acre, as compared with 400*l*. per acre which the Middlesex property commanded.

London Bridge.—The Bridge House Committee have just issued a report. According to it, there are, on an average, 116,284 horses led or ridden, and of vehicles of every description, and 611,217 foot-passengers passing over the bridge every week. Mr. Horace Jones, the City architect, and Mr. C. H. Gregory, civil engineer, concur in thinking that the reference to the committee would best be met by widening the bridge to the extent of 22 ft.,—11 ft. on either side,—but not on the cantilever principle, since they viewed with serious apprehension the possibility of a balcony sustaining a load of upwards of 500 tons. They would not tamper with the stability of the present structure, and suggest a scheme that would cost 55,000*l*. The committee agree that this expenditure should be incurred.

A NEW MODEL PRINTING-HOUSE.

The new printing-house of Messrs. Cassell, Petter, & Galpin, is situated on the site of the ancient Carrier's Inn, known as the New Inn, Old Bailey, and of several houses on the south side of Fleet-lane. It abuts on the north end La Belle Sauvage-yard, the present publishing and printing-house of the firm. It has a frontage of about 232 ft. to Fleet-lane; a view of which we give, together with plan of the ground-floor. The London, Chatham, and Dover Railway runs parallel with and forms the west side of Fleet-lane. The site was formerly the sloping bank or cliff of the Fleet, and at the base of the cliff at a depth of 18 ft. below Fleet-lane, retaining wharf walls were traced, which had adjoined creeks or docks of the Fleet. The necessity of keeping the basement floor at the same level as that of the existing premises necessitated an immense excavation, the whole of the cliff was removed over the entire site, the depth of the excavation at the east end exceeded 40 ft., the quantity of earth removed was 18,378 yards, and in consequence of the difficulty of access thirteen months were taken up in the slow and tedious process. A Roman sarcophagus was opened about half-way down the cliff, and is now in the museum at Guildhall. The skeleton of the Roman found within the coffin was plundered piecemeal, by antiquaries and others and dispersed. To obtain a reliable foundation for the massive walls of the building, it was necessary to excavate a still further depth, until the blue clay was reached, and the trenches were filled up with concrete. On the east of the site a spring of water was cut through, strongly charged with salts, especially nitrates. This spring has to be pumped up continuously to the level of the sewer in Fleet-lane. Its medicinal qualities are not appreciated. The principal purpose of the new building, to which all others are to a certain extent subservient, was to obtain a machine-room for thirty-six large printing-machines, arranged under supervision of one commanding superintendent, the great desiderata being to secure an abundance of light, so as to avoid the use of gas as far as possible. This machine-room occupies the area of the basement of the new building (12,600 ft.). There will be no bands or shafting visible in the machine-room, the bands to each machine working in trenches sunk beneath the floor, and the work will therefore proceed without vibration. The flooring will be of hard bricks, with teak-wood pathways. The walls are lined with glazed white bricks to a height of 7 ft. The machine-room is lighted by a central well, 70 ft. by 30 ft.; roof carried up to the top floor, and covered with a light glazed roof. There are five floors above the basement. The ground-floor will be principally occupied as the printing-office warehouse. The space over the drying-room is to be an open playground for the boys.

The first floor contains the administration, both financial and editorial; here also will be the library, private rooms, and conference rooms, a large schoolroom, two dining-rooms for the men, kitchen, &c. The second floor is given up almost wholly to stock. On the third floor will be placed the hand-presses where the lighter kind of work in printing is to be done; and the whole of the fourth floor will be the composing-room, well lighted, ventilated, and regulated in temperature, every means to these ends having been considered, and, where practicable, adopted. The large tower at the south-west contains a nest of separate airy and spacious reading-rooms for the "readers"; there is an annexe of fireproof character on the east side on all floors forming a buffer against the spread of fire, where only the new building abuts on adjoining property. These fireproof-rooms will be used as stores for plates, woodcuts, &c.; also for stereotyping, electrotyping, and other processes. The water-closets and lavatories are contained in a tower of nine stories, having access from each floor, but separated from it by a lobby. The water supply to the whole building has been happily secured by an artesian well. The water will be stored in five wrought-iron tanks, containing together 80,000 gallons, the highest tank being at an elevation of 110 ft. above the basement floor. There are two fire-cocks on each floor and on the roof, and tons of water can in one minute be thrown upon any point. The access to the building is by a fire-proof workmen's staircase at the north-east angle, and a stone public staircase at south-west angle, but there is also a continuous steam-lift for the use of the



NEW PRINTING HOUSE, FLEET LANE.——*Plan of Ground Floor.*

establishment only as fixed at the General Post-Office. The method of heating and ventilating is a modification of Captain Galton's system, as applied to the latest barracks. The elevations to Fleet-lane are of a massive business-like character. The material used is Portland stone to the level of the first floor, and white Suffolk bricks and terra cotta above. The whole is being carried out from the designs and under the superintendence of Mr. Francis Chambers, architect, who is represented on the works by his assistant, Mr. J. R. Wilson.

The arrangements for carrying on the various mechanical processes, &c., within the building have been so contrived as to economise manual labour as much as possible. The paper, as it comes from the mill, will be placed in a series of basement warehouses, from which it will be taken as required, and passed into the wetting-room, then smoothed by means of steam rolling machinery, and driven upon tramway trucks to the printing-room. Having been printed upon, it will be raised by a steam lift to the counting-room, and passed through a drying process. It will then ascend to the next floor, and be pressed by powerful hydraulic machinery, after which it will be carried, by means of the endless lift, to the binding-room, and thence conveyed down to the publishing-offices, thus making a circuit of the building.

The printing machinery is of various kinds, the most part being especially constructed for producing works illustrated with fine wood-cut engravings, the whole being, as before mentioned, driven by shafting placed beneath the basement level, and resting upon isolated foundations.

The boiler-house, which is outside the walls of the main building, contains three of Galloway's boilers, each measuring 22 ft. by 6 ft. 6 in., and adjoining is the engine-house, to contain two pairs of Tangye's horizontal engines, each pair being of 36 H.P.

The composing-room, which is noteworthy, will accommodate 200 workmen. It is well lighted, well ventilated, and fitted up with every necessary appliance besides especial provision for the personal convenience and comfort of the men.

The "readers," whose fate it is too often to be located in small, ill-ventilated closets, exposed to the noise and vibration of machinery, will occupy a suite of quiet rooms (at the summit of a tower), which have been constructed with a special view to their health and comfort.

The process of electrotyping, which involves the escape of irritating gases, will be carried on in a separate building, so arranged as to reduce its deleterious effects to a minimum.

Provision has been made for a workmen's kitchen, where food will be provided for the men and boys at the lowest rate, and the boys will have the use of a playground and gymnasium during the dinner-hour—and thus avoid the common practice of running about the streets.

The total number of persons employed upon the premises, including men, women, and boys, will be about 750, and some idea may be formed of the extent of the operations carried on by the mention of the fact, that exclusive of the production of an array of volumes in almost every department of English literature, the separate parts of the magazines and serials issued each month considerably exceed half a million. The paper shavings trimmed off the edges of the serial publications amount to 25 tons a year, while the other waste, including paper accumulating from the strict rejection of all imperfect impressions, exceeds 50 tons.

THE CONTRACT FOR THE LAMBETH NEW INFIRMARY.

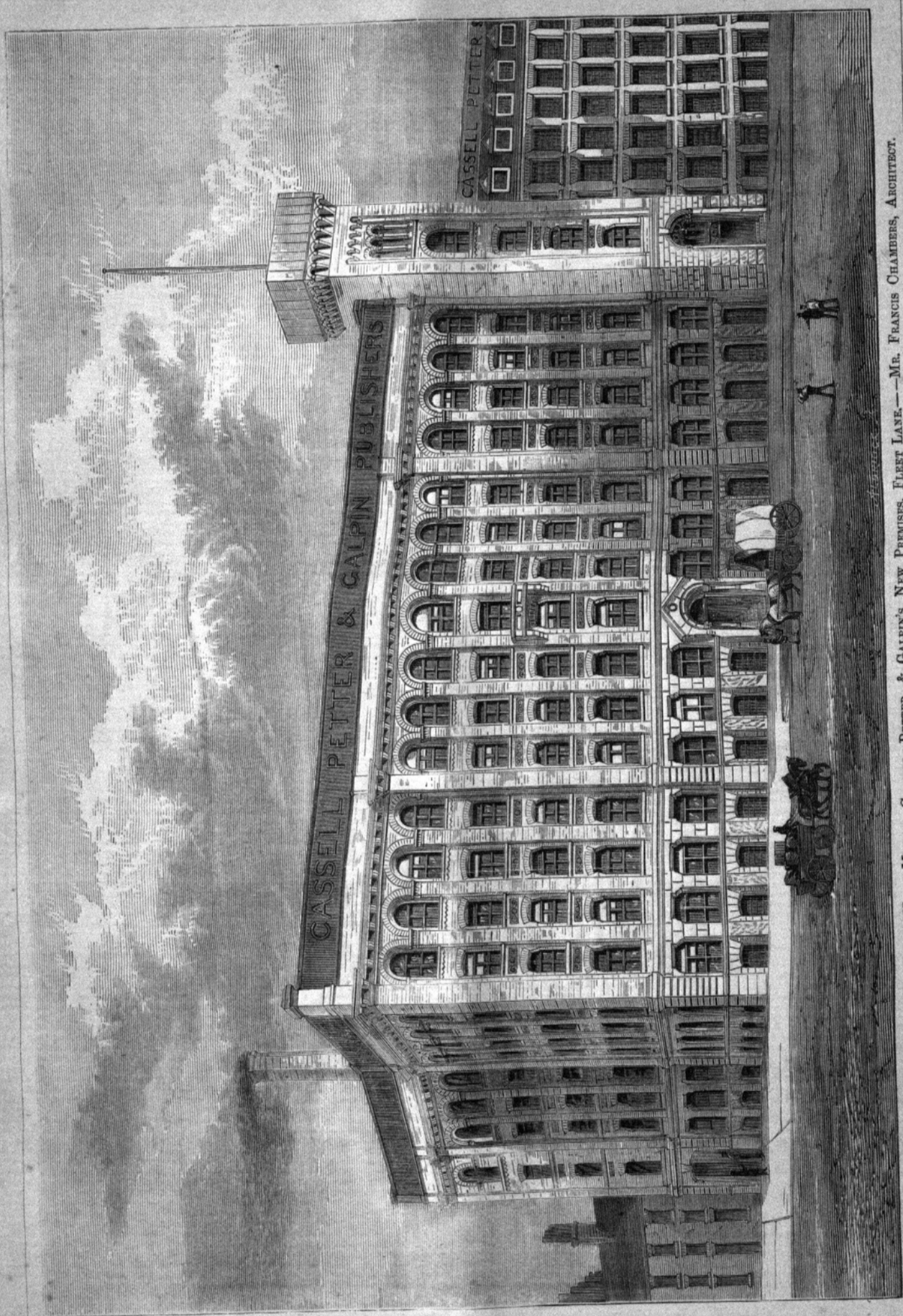
At the meeting of the Lambeth Guardians last week, the tenders for the new infirmary, outdoor labour buildings, receiving wards, and other buildings, which are about to be erected from the designs of Mr. Fowler, architect, were opened. They were fifteen in number. The tender of Mr. J. H. Tarrant, of New Kent-road, to erect the infirmary for 51,200*l.*, the receiving wards and other buildings, 1,540*l.*; and the outdoor labour buildings, 460*l.*; the total being 53,200*l.*, was accepted, subject to inquiries into Mr. Tarrant's financial ability proving satisfactory. A conversation ensued with respect to the question as to whether the other contractors might withdraw their tenders, and the Board be compelled to go through the process of inviting tenders again, in the event of the inquiries respecting Mr. Tarrant's financial position proving unsatisfactory. In order to overcome this possible difficulty, Mr. Taylor suggested that the Board should not definitely accept any particular contract until they had made all the inquiries they intended to make, and that the contractors be informed that the Board would decide the question at their next meeting. Mr. Taylor's suggestion was ultimately adopted.

WARRINGTON SCHOOL OF ART.

PROPOSED NEW BUILDING.

On the 11th inst. a meeting of subscribers and others interested in the Warrington School of Art, was held in the Museum, for the purpose of receiving a report from the sub-committee in reference to the erection of a new building for the use of the School of Art. The chair was taken by the mayor (Mr. Chandley), and there were also present—Mr. Alderman Holmes, Rev. O. H. Cary, Rev. J. B. Johnstone; Messrs. Bleckly, John Rylands, Brewtnall, S. Webster, Chas. White, Sharpe, Marson, Whittle, Crosley, Ellison, and Edward Milner, hon. sec.

Mr. J. Rylands proposed a resolution, "That it is desirable at once to secure the land, or a portion of it, offered by Lord Winmarleigh, and that the council of the School of Art be requested to open a subscription list, and proceed as soon as possible to secure the land"; which was carried, as also that proposed by Mr. Marson,—"That the Council of the School of Art be requested to prepare plans of the building required, and when ready submit them to a meeting of friends and subscribers after they have been approved by the Department of Science and Art."



STREET ARCHITECTURE, LONDON.—Messrs. Cassell, Petter, & Galpin's New Premises, Fleet Lane.—Mr. Francis Chambers, Architect.

ST. SEPULCHRE'S, HOLBORN VIADUCT.—Tower and Porch, as Restored by Mr. W. P. Griffith, F.S.A., Architect.

[See p. 749, *ante*.

ON HAMMERS.*

It is hardly possible to draw a distinction between a tool and a machine; the former is more simple than the latter. They so merge each into the other that it is difficult to say where the one ends and the other begins. A lathe, for example, is a handicraft tool, and yet in its ramifications and developments it becomes a very complicated machine. As a machine we are not concerned with it,—as a tool it might legitimately be classed in this course of lectures. It was, however, one of the earliest to be erased from the first list; now, however, it has for associates a goodly number of tools in far more general use than itself, which one by one have been set aside. It may be asked, What is a tool? How is it defined? Questions not easily answered. For our present purpose, it will suffice to state that an implement by which the power of man is enabled to change the physical forms of materials is a tool. If to this implement there be added appendages, which either extend its range or vary its mode of application, these appendages are "contrivances." There may, however, be contrivances not connected with tools as now defined, and then they are elevated to the dignity of tools. For example, a chisel or a hammer is a tool; the boxing with which the former is surrounded, as in a plane, and the handle attached to the latter, are contrivances, for by them the modes of application of a chisel and the powers of a hammer are extended and varied. A vice, a soldering-bit, a nail, a square, are not tools, but "contrivances" only.

Viewed thus, it may be said that by means of tools and contrivances man is enabled to increase and vary the human power, to economise human time, and to convert substances apparently the most common and worthless into valuable and useful products. Without tools the hand would be nearly powerless; add to it a hammer and a cutting instrument, and its capacity is increased many fold. Whoever contrived rollers as a means for moving heavy blocks of stone added a contrivance which very largely extended the powers of men. Whoever first applied grease to bearings and surfaces enabled man to utilise a much larger portion of his power. Whoever first, in truly geological prehistoric times, made an eye and a point in and on a strip of bone or shell, gave to man as a tool an invention far exceeding in importance and value anything yet accomplished by heat or electricity. Whoever in these same times applied a barb to a spear and a hook, introduced a contrivance of very high and inestimable importance.

The most ancient of tools is the hammer. In all parts of the world and amongst all people hammers may be found in use. So general are they that even the name "hammer" seems to have a pre-historic origin, for etymologists tell us that the word "hammer" is common to all the northern languages.

A tool more simple and more useful than the primitive or handicraft hammer cannot be found. Yet it has been so little esteemed during the countless ages since the first was made, that so far as your lecturer's researches have penetrated, the hammer does not possess any literature. This may be illustrated by reference to the encyclopædias, *e.g.*, "The Penny Cyclopædia" in its thirty volumes, and "The Edinburgh Encyclopædia," do not contain in alphabetical order the word "hammer." The "Encyclopædia Metropolitana" and the "London Cyclopædia" dwell upon the word "hammer" chiefly in its figurative sense. "Rees's Cyclopædia" has "hammer, an instrument of iron with a handle of wood, used in most mechanic arts to beat, stretch, drive, &c." The "Encyclopædia Britannica" and the "Oxford Cyclopædia" use terms similar to those employed in Rees. "The English Cyclopædia" speaks thus disrespectfully of this most primitive, ancient, and universal tool:—

"*Hammer.*—It will not be necessary to notice the hammer as a mere tool, but its importance as a machine renders a description necessary."

More recently, and in a book specially devoted to the tools and contrivances used by artisans, and which volume has both a table of contents and a comprehensive index, the hammer is not even named in these. Like the scaffolding of a building, the simple hammer seems always to be cast aside, and the writers of the articles in the "Encyclopædia" have correctly interpreted the universal treatment. The machine contrivances worked by other than human power, and to which they attach importance, are those with which this course of lectures is not to be concerned.

Before considering such views as may have suggested many of the various materials and forms of hammers now in use, it will be well to regard the hammer in, and of, and by itself. We are so apt to look upon it as a rude implement, necessarily associated with a superior class of finishing tools, that the materials, forms, and scientific principles involved in its construction and use, not only as an adjunct to other tools, but as a sole independent and final tool, are much overlooked.

In some handicrafts, and those too involving a high class of finished work, the hammer is the only tool employed. That great artistic skill in the use of the hammer, as a finishing tool, can be acquired is manifest from the beautiful illustrations of *répoussé* work to be found.

But we should be ignoring the skill of those who have gone before us, if we allowed ourselves to dwell exclusively upon the work done by hammers as finishing tools in modern days. As the hammer was in all probability the first formed of handicraft tools, so it was with equal probability the first tool used for the formation and ornamentation of articles which, whilst still intended for use, were also regarded as worthy of ornamentation.

It may, perhaps, appear somewhat out of place to refer to the shield of Achilles, so fully described in the "Iliad" of Homer, book 18, in the last 150 lines.* But if any one can appreciate the value of a hammer—as an independent tool—then he will read either the original description of the metal work on this shield in the language of Homer himself, or, failing in ability to do that, he will be amply repaid by a thoughtful perusal of the translation, given by either of our late Premiers, Lord Derby or Mr. Gladstone.

Homer flourished about 960 B.C. (*i.e.*, 960 + 1875) 2,835 years ago, and although the shield to which allusion is now being made may not have been actually fashioned, nevertheless, the description is of that which a hammer was poetically supposed capable of accomplishing. Indeed, the forge in Homer's day is described as not inferior to some of those at our large armour-plate and "Woolwich Infant" manufactories.

The late Earl of Derby gives us as Homer's description of the forge at which Vulcan wrought,—

"The bellows then directing to the fire,
He bade them work; thro' twenty pipes at once
Forthwith they pour'd their diverse-temper'd† blasts;
Now briskly seconding his eager haste,
Now at his will, and as the work required.
* * * * * * *
Then on its stand the weighty anvil placed;
And with one hand the hammer's pond'rous weight‡
He wielded, while the other grasp'd the tongs.
And first a shield he fashion'd, vast and strong,
With rich adornment . . . . . .
. . . . . of five folds the shield was form'd;
And on its surface many a rare design
Of curious art his practised skill had wrought."
Book 18, *line* 528, *&c.*

The account of the shield itself is too long, but Mr. Gladstone has condensed (as a table of contents) the incidents embossed upon it by hammering and inlaying. These incidents, it will be observed, are very unlike the "various shields" in the hosts of Satan, for the latter were "with boastful arguments portrayed" (Milton's "Paradise Lost," book 6, line 84).

The scenes wrought upon the shield of Achilles are—1. The earth, sea, and heavenly bodies. 2. In a city at peace there are—(*a*) Marriage festivities; (*b*) A judicial suit or trial. 3. In a city at war there are—(*a*) A scene before the ramparts; (*b*) An ambush and surprise; (*c*) A bloody fight. 4. The ploughing of a field. 5. The harvest and the meal in preparation. 6. The vintage, with music and a march. 7. A herd of cattle attacked by lions. 8. Sheep at pasture and their folds. 9. The dance. 10. The great ocean river encompassing the whole, as, in the mind of Homer, it encompassed the earth.

Mr. Gladstone remarks:—"Never was outward fact so glorified by the muse. Nowhere in poetry is there such an accumulation of incidents without crowding. Of the twelve pictures on the shield, almost every one contains a narrative." All this is described as the result of hammer-work.

Although hammers and hammer-work have been in past ages thus highly esteemed, yet whilst hitherto, in modern times, literature has disregarded the tool pure and simple, the wealthiest in the land pay very marked respect and honour to the tool itself. The diamond within gives to the casket its worth, and the value of a gem may often be inferred from the setting in which it is placed. Judged by this standard, the hammer holds a patriarchal pre-eminence amongst tools,—a pre-eminence to which its antiquity and usefulness fully entitle it. Not royalty alone, but all who derive their authority either from royalty or wealth, and who adopt an English view, that honour is shown by excessive display and paraphernalia, cover with valuable cloth the box containing the hammer to be used in case their carriage meets with an accident. The sides of this cloth which covers the hammer, and the doors of the carriage which enclose the owner, are alike emblazoned with heraldic arms. Is it from deferential respect to this most ancient of tools that on the hammer-cloth is often a more expensive emblazonment than on the doors of the carriage?

For examples of the use of hammers in the production of works of great variety and extent on a large scale, see the ancient hammered wrought-iron gates, hinges, panels in the architectural room in the Museum at South Kensington, or (only of a different character, but still hammered work) the gates recently erected near the courts in Lincoln's-inn; also the various suites of mail and chain armour in the Tower of London; also the iron panels on the table, especially the beautiful iron spray formed out of the solid, without either welding or brazing; also the raising and embossing of metals to which your attention has been directed; the formation of gold leaf, the springs of carriages, and the stiffening of saw-plates.

The nature of work to be done by hammers calls for very great differences, not only in the form, material, and weight of the hammer-head, but also in the appendages to these. There are the material and form of the handles, the angle at which these handles shou'd intersect the axial line of the hammer-head, the position of the centre of gravity with respect to the intersection of this axial line, the length and elasticity of the handle. If the centre of gravity is not in the central line or longitudinal axis of the hammer-head, then there is a tendency to bring the hammer down on the edge of the face and not on the face. If this defective construction were great, the muscles of the wrist may not be strong enough to counteract the tendency. If the defective construction is slight, then the work is often marked with angular indents. Arrangements, too, may be required for modifying the intensity of the blow, whilst retaining the effects resulting from a heavy hammer where a light one would be inefficient.

As the principles which govern the operation of small things may be best studied in large ones, so here. For this purpose we may at the outset regard the hammer as a weight at one end of a rod, of heavy or light, of elastic or non-elastic material, the position of the hand on this rod varying according to requirements (as the fingers of a violinist on the strings of a violin) and so modifying the effects of the hammer. Speaking generally, the effect is produced by allowing what we must call the head to fall through a space, and then come in contact with the material to be influenced by the blow. Perhaps, the object to be accomplished by the blows of hammers are more varied than those to be effected by any other single tool. It may be questioned whether there is any handicraft operative who carries through any branch of his trade without using what he calls, or what we may call, a hammer. Although under this general name each artisan understands a certain tool employed in his own trade, it does not follow that he generalises, and so extends his views as to comprehend all the varieties, both in material and form, which present themselves between the heavy two-handed maul and the smallest tapping-hammers of the jeweller and watch-maker, file-maker, and diamond-splitter.

It is curious to see how in the same trade the hammers are for different purposes made of different materials. The engineer, for example, uses hammers faced with steel hardened, the stone-breaker (or mineralogist) hammers faced with steel softened (or rather not hardened). Again, in another part of his progressive work, the steel hammer with which the engineer com-

* From the third lecture of the course of Cantor Lectures on "The Material, Construction, Form, and Principles of Tools and Contrivances used in Handicraft," by the Rev. Arthur Rigg, M.A.

* See Lord Derby's "Iliad," book 18, line 528, &c.

† The expression must be limited to the intensity of the blast, although it reads as if Homer was as familiar with "hot-blast" as we are; perhaps, he may have been.

‡ It would not have accorded with the acknowledged power of Vulcan to have represented him as needing the help of a sledge-hammer man.

menced his operations gives place to a bronze or copper one, and this is sometimes displaced by one of lead alloyed with tin, and the usual handle entirely discarded. It then assumes in all respects save material the form and mode of handling as described in the account of the prehistoric stone maul. This leaden cylinder, about 2 in. in diameter and 6 in. long, is the primary form of this second maul, which is about 3½ in. in diameter and 3 in. long, the ends being very much spread out. There is no handle to this tool; occasionally it is made of a mixture of lead and tin, in order to impart a hardness not possessed by lead alone. To strike where required the bright part, in the erecting of heavy machinery, the engine-fitter makes use of this contrivance.

The plumber dismisses all these, and for direct action upon the material employed in his trade he uses a hammer of wood, discarding not only the material, but also the form of hammers used in allied crafts. Indeed, one of his hammers serves a double purpose, for if at one moment it is a hammer, at the next it is used as a swage. In some cases, as in the working of copper vessels which have been silver-plated or gilt, the coats of the precious metals are so thin that, although the weight of a hammer-head is required, yet even the wooden hammer of the plumber, or the still softer leaden hammer of the engineer, is equally unsuitable, and therefore the workers in these metals cover the face of their hammers at times with one or more layers of cloth held on by a ring which slips round the ordinary hammer-head as the hoop on a child's drum. The covering of the hammer-head with cloth, to preserve the material on which the blow is struck, is not, however the only use made of a jacket over the hammer. For one purpose when a leather jacket is employed, even a leaden hammer might prove inconveniently noisy.

In a case brought before the Lambeth Police-court on the 19th of January, 1875, Edward Simpson, shoemaker, and others were charged with house-breaking. The implements used in this occupation were produced, and the newspaper report states that "one feature of the exhibition was a leaden hammer capped with leather, which it was stated was used for the purpose of driving wedges into safes, the leather causing the blows to be almost noiseless."

The veneering hammer, again, is compound, one end being formed of metal and the other of wood. This hammer is used, the one,—or metal,—end as a squeezing hammer (if such a term may be employed), the other as a tapping hammer, in order to ascertain by the sound produced where the veneer is adhering, and where it is not.

The stonemason seems to claim a universal choice, both of material and form. As to material, he has and frequently uses hammers made of wood, of iron (steel-faced), and of an alloy of lead.

In some cases the hammer and the anvil mutually change places, the hammer of wood, the anvil of metal, or the converse. Nor is the wood always of the same character. As varied as are the characters of the woods themselves, so varied are those chosen by different crafts for the employment of each craft. Even the varying density of the woods gives place more frequently than otherwise to lead, and we meet with metal hammers used on lead-covered anvils.

In the last journals of Dr. Livingstone, he mentions (page 89) that on one occasion he saw a bushwoman, in Cape Colony, using as a digging-hammer a round stone with a hole through it. Through the hole a rod was inserted. The end of the rod was used for digging, the weight of the stone assisting the muscular effort. He also states that these people prefer stone hammers and anvils because they do not burr up as iron ones do. In vol. i., page 146, there is a woodcut illustrative of the mode in which these stone-hammers and anvils are used. It differs materially from the plans supposed to have been adopted in the Stone Age. The hammer stone seems to be selected with careful reference to its shape, which approximates to that of a truncated cone. It is then bound round with the strong inner bark of a tree, and handles being formed of loops on opposite sides, the man, using both hands, raises the stone hammer above his head, and thus by muscular exertion, aided by gravity, he gives a blow of the requisite intensity. A heavy stone sunk in the ground forms the anvil. The bellows consist of two goat-skins, with sticks at the open ends, which are opened and shut at every blast.

On page 155 of the same journal, is the woodcut of a mallet used by the same people for separating and softening the fibres of bark by a process of tapping. The head of the mallet is often of ebony, with the face cut into small furrows, smaller, but similar to those used on our meat-hammers. There is what we may call a mallet (although differing in form from those we use) which was brought very many years ago from Otaheite. This also is cut on its four sides into small longitudinal furrows; each side is not an exact counterpart of the other. There is also the felted cloth made by the use of this mallet from the bark of trees. The mode of proceeding in the manufacture is identical in principle in the interior of modern Africa and in long past days in Otaheite.

THE PUBLIC HEALTH OF TOWNS.*

One of the grandest mistakes the public can fall into, is to consider that the work of sanitary reform, and the carrying out of all good sanitary measures and appliances, belong solely to corporations and sanitary inspectors acting under them. Every person can promote public health by attending to his own health; to the cleanliness of his own individual home, and working premises; and to the tidy condition of the accesses, courts, and grounds attached thereto. Co-operation is much valued by sanitary inspectors. Unfortunately, however, many do not co-operate and assist them who could, and who, from their social position and intelligence, ought to do so. And many again look upon them as a parcel of intruders,—impertinent and interfering fellows,—and set themselves to thwart them, and to evade statutory requirements, as far as they can. The want of co-operation of the kind alluded to may be accounted for in various ways: by the blindness of such persons to the dangers from unhealthy surroundings; by their fear of being led into expenses on account of improvements; by their firm determination not to be dictated to in the management of their own properties; or by, it may be, imprudent dealing at the hands of an inspector, or some of his staff. As sanitary improvements, however, are carried into effect, the beneficial results following thereon will do much to remove existing obstacles from the way. Education will also do more; and now that so great interest is being taken in schools by the public, and so much attention is being paid to them by school-boards and others, it would be well to have the pupils attending such schools taught the principles of health; and habits of cleanliness and respect for outward tidiness should be inculcated and impressed upon them with the view of promoting both present and future improvements on the sanitary condition of the people.

The sanitary officer will succeed best by exercising great care, neither to exact from people unreasonable nor needlessly expensive works, nor to cause them to make unnecessary alterations on their properties. And he should endeavour, as far as possible, to deal courteously with the public, and to carry them along with him. In this way he will strengthen his position, and gain the moral support of the community. Official work under the department of public health is rapidly developing itself, and new channels of operation are daily being opened up. This development is, in many places, ahead of the sanitary staff employed, and the consequences are, that the working staff is ofttimes overwhelmed by the magnitude and ramifications of the work to be overtaken and discouraged by more being expected of them, than they can really accomplish under the circumstances. But I am confident, when corporations come really to see the magnitude and difficult nature of this work, and consider fully its importance and urgency, and the chronic insanitary habits of a large section of the people, they will rival each other in their liberality to provide and support a sufficient staff of men, characterised by intelligence, activity, prudence, and common sense; and in giving them every encouragement amidst the dangerous and disagreeable duties they are called to perform. The duties of sanitary inspectors are neither pleasant nor safe; and it may truly be said of the most of those officers, that in the exercise of their important duties they carry their lives in their hands.

We cannot expect that all towns and populous places will be equally healthy, even under regulations and appliances of the highest sanitary order. There are other circumstances which will materially affect their condition of health, over which there may be no control; and, therefore, the death-rate alone cannot be taken as the gauge of sanitary efficiency. A man who has a bad constitution, and is far gone in consumption, would not likely prove a very promising patient for the physician. Just so, some towns and populous places have very bad constitutions. They stand on damp soils, are subjected to fogs, occupy low positions, are studded all over by manufactories, are overcast by smoke and deleterious gases from chimneys, have narrow irregular streets, and long narrow closes in near proximity, bounded by high dwellings in rickety condition, with low ceilings, badly lighted, and without means of ventilation, and are but partially and badly paved. Such towns are not easily dealt with. Much time is required to cope with what can be reached; and only, in many cases, with a new constitution in the shape of the demolition of the insalubrious parts, and the introduction of wide streets and new buildings having ample ventilation, can a moderate average rate of mortality be attained. But the death-rate is not on this account to be left out of calculation. I consider that, to have towns mapped out into small districts, and tabulated with the death-rate per month opposite each, information of the most valuable kind will be got, and the insanitary condition of special localities indicated, and the attention of sanitary inspectors called to them. In addition to this, it would also be of value to have a quantity of rainwater occasionally intercepted as it falls in each of the districts (at the same time), and subjected to analysis, in order to discover what impurities may be floating in the atmosphere; and whether the atmosphere of one part of the town is more impure and injurious to health than another, and how such has come to be the case. Such analysis would no doubt point to some causes, which might at least be modified, if not altogether removed.

The health of a town will be beneficially affected by wide streets; and it is therefore of the greatest importance, that corporations and police commissioners should have ample powers to regulate the widths, and to fix the directions and levels of every new street within their respective burghs,—nay more, I think it is essential that they should have powers to open up necessary leading thoroughfares, under fixed statutory powers, through open lands within their jurisdiction. Where a number of properties lie in the lines of such thoroughfares, it is highly probable that the owners thereof may not be of the same mind regarding these; and so, independently, each lays out new streets, or submits plans thereof, in the lines which he considers will bring him the best return; and thus, in many instances, streets are laid out which do not run into each other,—having no leading connexion,—and no proper sweep of ventilation. Now I hold that the interests of the owners of such grounds are not the only interests to be considered; these lands take their value from the town and their proximity to it; and the enhanced value of such lands may well afford proper lines of thoroughfare, and ample breathing spaces for the population which will in the course of time gather on them, and whose health will greatly depend thereon. It is also of sanitary importance to have all new streets laid out and sewered before building operations are allowed.

Even greater powers than do exist in Local and General Acts are still required to regulate, amongst other things, all classes of buildings, and the open spaces in rear of dwelling-houses. It is requisite that ample and well-defined powers should be granted to, and exercised by, those regulating such matters. According to present custom in most towns, all sorts of buildings are huddled together, side by side with dwelling-houses. Sometimes there are erected on either side of dwelling-houses, warehouses, workshops, manufactories, or other such premises, of much greater width and height; and leaving only small, confined, and ill-ventilated courts in rear of them, which cannot fail to be highly injurious to the health of the occupants. Now, in the laying out of new building-ground, the existing evils in the older parts of towns should be avoided. Therefore public works and workshops ought to be, to a very great extent, if not altogether, grouped in various districts; and shops and dwelling-houses in others. Such an arrangement would greatly improve the health and comfort of the people.

The heights of all buildings should generally

* From a paper by Mr. William Mackison, C.E., Burgh Surveyor, &c., Dundee, read before the Sanitary Inspectors' Association for Scotland, at the first annual meeting.

be regulated by the widths of the streets on which they abut. And I think it most desirable that dwelling-houses should not be of a greater height to the eaves than four-fifths of the width of any new street; nor warehouses and manufactories higher than the full width, where dwelling-houses are built on the opposite side. Where, however, the latter class of buildings are erected on both sides of a street, the height of such buildings might be somewhat greater. But minimum widths should be fixed for both classes of streets, so as to secure proper ventilation and thoroughfare. The chimney-stalks of all public works should be built sufficiently high, to carry the smoke and bad gases emitted therefrom over the tops of the dwelling-houses; and every effort should be put forth by sanitary inspectors to have all furnaces fitted up with the best appliances for consuming their own smoke.

The healthy condition of dwelling-houses will to a large extent be determined by the widths of the open spaces left in their rear, and the manner in which these are occupied and kept. Where ground is to be laid out for feuing purposes, and where building sites are sufficient to admit of minimum open spaces in rear of proposed dwelling-houses, co-extensive therewith, and at least equal in depth to the widths of the streets on which they will abut, such open spaces should be required. And Boards exercising jurisdiction over the erection of dwelling-houses should have power to insist on ample open spaces being provided in rear of such buildings. Each of these open spaces might, with advantage, be divided into two parts: the one, say one-fourth of the width next to the houses, to be formed into a paved court, for the benefit of the children, and the other, or remaining three-fourths, to be laid out as a washing-green, or for garden purposes, as circumstances might require, and having the washing-houses and coal-cellars built along the side-walls, and the ashpit and other necessary conveniences suitably placed and screened at the back wall, with paved walks thereto. Where grass will not grow on the spaces for washing-greens, and where these are not or cannot be kept in good condition, such spaces should be paved, or covered over with asphalte. Again, where the business requirements of the town render the addition of saloons to shops necessary, these might, in certain circumstances, be allowed to be built to the height of one story, with flat roofs, over portions of the back courts, on condition of the areas of the paved courts thereby affected being extended backwards in equal proportions to the spaces thus taken off them. This system of feuing would, as a matter of course, spread the town over a larger area; would promote the healthy condition of the people; would benefit the feuars; and would also allow the superiors a fair value for their lands.

The ventilation of all single-room dwellings should be insisted upon, and ample provision made for admitting the fresh air free of draughts, and for carrying off the vitiated air. In such dwellings—which are in most cases very unsatisfactory in their conditions—many persons are couped up in the most indecent manner. Such rooms should be large, and have each a space sufficient for a bed and for dressing purposes, partitioned off by a movable screen of the height of 7 ft. or so, to afford privacy, and promote common decency. The promoting of morality will always advance the good sanitary condition of the people. If the houses of the working men with families consisted of three rooms instead of two, and these were rightly used by them, it would greatly tend to promote the physical and moral well-being of those families.

I have no doubt that the great mortality amongst children is partly caused by their being often exposed to cold draughts in houses, and left sleeping in rooms with damp floors and open doors and windows. Provision to render it imperative on all persons building new dwelling-houses to have them officially examined and duly certified as fit for habitation before occupancy is most desirable and necessary.

UNDERPAID SURVEYORS.

Sir,—As your correspondent "L. L." is often surprised at the low salaries paid to town surveyors, I beg to send you an advertisement, taken from the *Bristol Mercury*, of the Radstock Local Board requiring a surveyor and sanitary inspector, who must devote the whole of his time to the duties of the office, and be acquainted with road-making, sanitary work, and accounts, at a salary of 60*l.* per annum. I may state that the person who was elected is the son of a grocer and draper living in the place. Can any one be surprised at the *unsanitary* state of some of our towns and villages?

Surveyor.

PUBLIC IMPROVEMENTS AT NEW MAROKE.

Of the numerous mining villages springing up in Cleveland few are improving more rapidly, and making greater provision for the social and spiritual wants of the inhabitants, than that of New Maroke. The village is in close proximity to the Upleatham mines of Messrs. J. W. Pease & Co., and, though of very recent growth, it has already a population of 1,600 inhabitants. A little church, the gift of the Earl of Zetland, has just been completed, and will shortly be consecrated; and the Primitive Methodists, who form a rather strong body at the place, are building a commodious chapel, which is expected to be finished in the early part of next month. Through the liberality of Messrs. J. W. Pease & Co., the village will also possess ere long a literary institute. The new building, which will cost something like 2,000*l.*, has already been commenced by the contractor, and will contain library, reading-room, lecture-hall, recreation-room, and ante-room. The lecture-hall will be 42 ft. by 9 ft., and 29 ft. wide, and the gallery 29 ft. by 22 ft. The reading and other rooms will be large and spacious, and afford every comfort for the members. A neat cottage for the attendant will adjoin the institute. The architect for the building is Mr. Carrington, of Maroke. Mr. E. Yockney is the contractor for the mason work; and W. Harrison, Guisborough, for painting and glazing.

SANITATION OF HOUSES.

At the recent meeting of the British Medical Association in Edinburgh, Mr. W. Eassie, C.E., of London, read a paper "On the Sanitation of Houses, especially with Reference to Drainage." He said:—The evils of improper drainage are best observed in houses that have been from time to time added to until the cottage has become almost a mansion. One is then able to trace the first awakening up of the inmates, when the patrimonial cesspool has filled up and choked the drains. When this happened in villages, all that was done was merely to partially empty the receptacles and clean out the drains. And when this had occurred several times, and the sides caved in, a new dumb-well was sunk, and the drains led into it, the old pit being covered up with a stone. It was cheaper to do this than to fill it up; and, besides, this procedure did not necessitate the absence of the family. It was the same in towns, and only a week ago I laid bare in a West-end London house three cesspools which had been dug in most brotherly proximity, and abandoned in rotation as they filled up with ordure and filth. Four cartloads of nightsoil were removed, which could not have seen daylight for half a century. Nor would it now, had not the rats formed runs in their vicinity, and allowed horrible smells to invade the house by way of a long-forgotten back drain. The reason why these ancient nuisances are found inside houses in towns and cities was not because they could not be accommodated outside the house, but because the slops from the kitchen and bath and laundry wastes were insufficient to flush the more solid wastes outside the walls. In nearly every case, too, the drains were of brick, laid with uneven bed, and through the joints of which the fluids percolated. We will take an instance. A cottage is drained into a cesspool in the kitchen, and when that is full another is dug, until the place is honeycombed with them, the subsoil saturated, and the well poisoned. A common privy is used in the yard, and this performs the same evil functions. By-and-by waterclosets are introduced and earthenware pipes, and the cesspool for these is now dug down in the garden, with a lower one for an overflow, and both cemented down airtight fashion. There is no ventilation either, except through the trapping water of the syphons at the foot of sink waste, soil-pipe, or rain-water stack. And here I may say that the drainage into a cesspool is not necessarily dangerous, provided only that the waste-pipes of the sinks deliver outside over a trap; provided too, that the soil-pipes are carried roof high, and a foul-air withdrawing cowl fixed upon them all would be well. It might, in some cases, be absolutely necessary also to ventilate the cesspool by an upright shaft, or a ventilating charcoal trap in the stone cover, and it might even be wise occasionally to ventilate the march of the drain. Where a common privy is used, an earth or ash-closet ought to replace it. The next difficulty arises where a parish sewer is put in the main road, and the value of the land enhanced so much as to make it worth while to add an extra wing or two, to convert the old stables into servants' offices, and to erect new stable accommodation. When this has happened, sometimes the one-half of the house is drained into the sewer and the other half into the old cesspools. The old cesspools have not, however, been dug up in the basement of the house, neither the urine catch-pit in the stables. The result of this is not difficult to imagine. Even should the whole of the cottage chrysalis, but now winged, mansion be drained into the new sewer, it is just possible that the drains are laid without fall, or with backward fall; syphons put in where they ought not to have been; rectangular bends instead of acute ones; and a ventilating shaft not only forgotten, but the sinks, baths, and lavatories taken direct into the drains: and the result, if not disastrous in the matter of health to the inmates, has proved sufficiently annoying to compel the dismissal of the builder and the attendance of the engineer. It is very easy to so arrange the plan of a house that the whole of the wastes shall deliver immediately outside the house, and to have nothing but the outside wall between the water-closets, lavatories, and sinks. When it is found advisable to drain the basement, it can be disconnected from the main drain so to speak by interposing over the junction a ventilating shaft. The sinks and lavatories should all deliver over an open chamber. For the rest the walls of the house should be built hollow, and protected from *rising* damp also by a proper damp-proof course.

REDCAR RACE-GROUND.

Considerable improvements have been made on the race-course at Redcar. The old wooden stand has given way to ranges of permanent buildings. Two lofty brick and iron stands have been erected, which together will accommodate over 5,000 persons. The architect for these erections is Mr. Adams, of Stockton-on-Tees. The large stand for the general public, in design, is similar to that at the Alexandra Palace race-ground. The steps for the accommodation of the spectators spring from a low terrace, rising only a few feet from the ground, and they are continued upwards to a great height, giving accommodation for a dense body of people. They are surmounted by a balcony, intended for the press and trainers, and to which entrance is obtained by a staircase from the weighing-room. The stand is placed at such an angle with the course that from any portion of it the entire circuit of the course can be seen. The whole building is substantially erected, and we believe that the cost is under 3,000*l.* The new stewards' stand is a two-storied erection, with ornamental balconies and with spacious retiring-rooms in the basement. The enclosure is spacious and capable of accommodating a large assemblage.

DECORATION OF ST. GEORGE'S HALL, LIVERPOOL.

The interior of St. George's Hall has been re-decorated by Messrs. Alexander White & Sons, of that town, under the superintendence of Mr. Thomas Shelmerdine, jun., the Corporation surveyor. The length of the large concert-hall is 170 ft., the width on the ground-floor 77 ft., and the width on the gallery floor from wall to wall 100 ft. The height of the ground-floor to the crown of the arch is 95 ft. Messrs. White's estimate for decorating the large and the small concert-rooms, including all extras, is 3,745*l.*, and they have carried out the work in a manner to satisfy the Corporation. They were, however, rather hampered in their progress by a strike of labourers, which delayed the erection of the scaffolding for upwards of a fortnight. At length that part of the work was proceeded with, the scaffolding being erected in three sections, commencing at the north end of the hall. There are fifteen large panels emblazoned with various coats of arms, the principal one being the Royal arms in the central crown of the arch. Next are the Liverpool arms in various panels, those of the House of Lancaster, St. George and the Dragon, and the arms of the Prince of Wales. All the armorial bearings, which are in relief, have been emblazoned in heraldic colours. The chandeliers in the great hall have been re-burnished and re-fixed. It was impossible to introduce more window-light without interfering with

the exterior of the hall; but, after consideration, it was deemed desirable to take out the small diamond patterns of glass which had originally been introduced in the windows, and which interfered considerably with the light. This has been done, and large plate-glass windows, set in oak sashes, have been put in, and now when the visitor enters he finds that there is nothing sombre or gloomy in the aspect.

COMPETITIONS.

Brighton School of Art and Science.—Mr. J. S. Gibbons, of the firm of Goulty & Gibbons, of London and Brighton, architects, is the author of the first premiated design for the proposed new building to be erected for this institution in the Grand Parade; Mr. J. Toner, of London, taking the second award. Ten designs were submitted in competition. The limit of the amount within which the architects were confined was 4,200*l.*

Bridgend Schools.—Sixteen designs were submitted in competition for the new buildings for the Bridgend School Board, which was to accommodate 300 children, with a master's residence. Several designs were rejected at an early stage, and finally the designs marked "Y. Y.," and "A Midsummer Night's Dream," were awarded the first and second premiums. The author of "Y. Y.," who is to be entrusted with the execution of the work, is Mr. Henry C. Harris, of Cardiff and Cooper's Hill, Staines; "A Midsummer Night's Dream" being the work of Messrs. Haddon, Brothers, of Hereford and Malvern. Among the local competitors, Messrs. James, Seward, and Thomas, of Cardiff, submitted three designs; and Messrs. Wilson & Willcox, of Bath, two. The design, "To be or not to be," we believe by Mr. W. D. Blessley, of Cardiff, was placed third.

LONDON SCHOOL BOARD SCHOOLS.

Stoke Newington.—A new school was opened on the 10th instant, in the Gainsborough-road, close to Victoria Park, and overlooking Hackney Downs. The building consists of three stories, with ample playgrounds, and a separate building forming the caretaker's house. The ground-floor, in which are placed the infants, has a large schoolroom and two classrooms with recesses, lighted from above, for galleries. The girls on the first, and boys in the second floors, have a like accommodation (except the recesses), with ample cloak-rooms and lavatories approached from their respective staircases. There are also rooms for the master and mistress. The style of architecture employed is that of Queen Anne, the architect being Mr. E. R. Robson, and the contractor Mr. Ennor, of Commercial-road; Mr. Ellson was the clerk of works. The school will hold 730 children at a total cost, including purchase of ground and other expenses, of 10*l.* 11*s.* 5*d.* per head. The amount of the contract was 5,930*l.*

Lambeth.—On the 13th inst, Mr. E. H. Currie, vice-chairman of the Board, presided at the opening of a new school in Walnut Tree-walk. In the course of a long address, he said that the school was, perhaps, the most peculiar one in its way that the Board had built in London, because it was intended exclusively for girls and infants. The building in which they had met would accommodate 779 children,—namely, 235 girls and 544 infants. Notwithstanding the present accommodation, there were nearly 1,000 children who were deprived of means of proper education. At present the Board had accepted contracts for the erection of 135 schools to accommodate something like 110,000 children.

THE BAINBRIDGE MEMORIAL CHAPEL, BYKER, NEWCASTLE-UPON-TYNE.

The Wesleyan chapel, which has been erected at Byker, as a memorial of the late Mr. Cuthbert Bainbridge, was opened on Tuesday, the 10th inst. Some time ago the Wesleyan Methodists of the Newcastle district resolved to remove from their old place of worship at St. Lawrence, and to open out a mission chapel at Byker, with the view of ultimately erecting a new place of worship there. The building opened to the public comprises, on the ground floor, a chapel, designed to accommodate about 320 persons, approached from the turnpike road by a double flight of stone steps, and having an inner porch, a vestry for the minister, with w.c. and lavatory, and staircase leading to the floor below. The schools are arranged upon the basement floor, with an entrance from Edwin-street, and, with the classrooms, will give accommodation to about 400 scholars. A spacious area has been formed round the building to give light and ventilation to this portion of the building. The warming will be effected by means of a hot-water apparatus placed in the boiler-house in the sub-basement. The building has been designed in the Gothic style of the thirteenth century. Messrs. N. & R. Reed have carried out the works in the most substantial and satisfactory manner as sole contractors, employing as sub-contractors, Messrs. R. B. Charlton & Co. for the plumbing and gas-fitting; Mr. Beck for the slating; and Mr. J. Messenger for the painting and glazing. The cost of the building has been 2,920*l.*; and it is satisfactory to add that there are no extras over the contract amount. The total cost, including price of land, building, architect's fees, and other items, will be about 3,700*l.* Mr. Thomas Oliver was the architect.

HORTICULTURE AT THE INTERNATIONAL EXHIBITION, PHILADELPHIA.

Mr. Cunliffe Owen, C.B., the British Executive Commissioner, is making known to foreign intending exhibitors in the Horticultural Department what will be best appreciated there, and those concerned should obtain the circular.

Besides plants, *Adornments of Horticulture* are asked for,—Garden statuary, fountains, vases, pedestals, summer-houses, and window gardening as applied to dwellings. *Garden Requisites*,—such as horticultural buildings, propagating-houses, hot-beds, &c.: the best mode of heating them; and as to *Art and Science of Horticulture*,—Designs for laying out gardens and the improvement of private residences; designs of rustic constructions and adornments for private and public grounds, public squares, parks, &c., showing arrangement of commercial gardens or nurseries, and for the parterre; examples of planting and the ornamental grouping of trees, plants, and shrubs; and the treatment of water for ornamental purposes.

BRIDPORT SCHOOL OF ART.

The exhibition of the works of the students and the annual meeting took place in the Town Hall on the 13th inst. The works were inspected by a large number of visitors. In the course of the proceedings the Rev. R. L. Carpenter (secretary) read the report of the committee, in which they say "They have now to record a further advance. In the local examinations, in April, 36 students were successful, whilst 26 was the highest ever reached before; 543 works were sent up for inspection to South Kensington, while, till last year, 200 was the average; on these 21 industrial students earned grants, and 16 students were awarded prizes, while the works of eight students were selected for national competition. Two ladies in former years have obtained the national book prizes; but this year, for the first time, medals have been gained—a silver medal by Mr. J. H. Dunham, and a bronze medal by Mr. F. H. Newbery; both these students are making art their profession."

CASES UNDER METROPOLITAN BUILDING ACT.

Surveyors' Fees.—Noah Moss, of 6, Montague-road, Victoria Park, was summoned by Mr. John Turner, one of the district surveyors of Islington, as being the builder or workman engaged for erecting or doing certain work to a house on the west side of Alson-road, Islington.

Mr. Turner said he had found the defendant on the building at work as a carpenter, and when he asked him who was the builder he said he did not know, but he could point him out to him. The contractor should have given him two days' notice of his intention to build before the building was commenced, but that was not done. The defendant was summoned, as he could not find out the master's name. The Act provided that the master builder, or any person who executed any part of the building, might be summoned. The defendant was very civil to him, and he had reason to believe that he was only the workman, and not the builder.

The defendant, said, in reply to the charge, that he was not the master builder, and was only employed on the building as a journeyman.

Mr. Barstow fined the defendant 10*s.* and 2*s.* costs, or in default ordered him to be imprisoned for ten days.

The defendant, who said he had no money, was removed in custody.

CHURCH-BUILDING NEWS.

Gloucester.—In consequence of many complaints respecting the defective state of the roof and the ventilation of St. Mary De Crypt Church, it has been determined to remedy these defects. This work is to be carried out under the direction of Mr. Waller. Further restoration being desirable, a committee has been appointed to consider the additional work suggested by Mr. Waller. His chief recommendations are thus summarised:—(1.) Restoration of the roof and improvement of the ventilation; (2.) Thorough cleansing of the interior walls, including the pointing of the old stone work; (3.) A new system of lighting the whole church by means of lines of gas jets in the chancel and coronæ of light round the pillars of the nave; (4.) Additional improvements and repairs in the chancel and other parts of the church. To effect the restoration between 500*l.* and 700*l.* are required. Mr. Waller also recommends that the whole of the church be well cleaned, and that the white and yellow wash be carefully taken off the dressed stonework, defective stones, of which he believes there are but few, being reinstated, and the joints of the stonework pointed; and also the removal of the western gallery.

Awbridge (near Romsey).—The memorial stone of a new church, to be named All Saints', has been laid by the Rev. T. H. Tragett, of Awbridge Danes, who gave the ground. The site of the church is on the borders of the grounds of Awbridge Danes, in the parish of Michelmersh. The design is treated in the Decorated style of Gothic architecture. It consists of a nave, chancel, vestry, porch, and vault under the vestry for the warming apparatus. The nave is 58 ft. in length, by 21 ft. 9 in. in width, and is arranged to accommodate 145 adults and forty-two children. The chancel is 23 ft. by 20 ft., with choir-sittings for sixteen. In all the church contains sittings for 203 worshippers. The exterior of the building is faced with Swanage stone, with Bath stone dressings. All the roofs are open-timbered trussed rafter roofs, covered with tiles. An oak bell-turret, with a shingle spire, on the west of the nave-roof, will carry three bells. The church has been designed by, and its erection will be carried out under the superintendence of, Mr. John Colson, of Winchester, architect, and the contract has been taken by Mr. John Crook, of Northam, Southampton, at 2,250*l.* The clerk of the works is Mr. John Williams, of London.

Preston.—St. Saviour's Church has been re-opened after cleaning, completing, and erecting a reredos. The reredos is from the designs of Messrs. Myres, Veevers, & Myres, of Preston. It is executed in Caen stone, and divided into three bays, each with enriched centre panels, the centre one being surmounted by a crocketed gable and a moulded arch, supported upon a triple cluster of columns, the outer columns being of green polished marble, each having a foliated cap and moulded base. The reredos is surmounted by a perforated and foliated cresting. On each side the space to the level of the east window is covered with Maw & Co.'s majolica tiles in patterns. The work of the reredos has been carried out by Mr. H. T. Miles, of Preston, from the architects' drawings, and under the supervision of Mr. T. H. Myres. The south chancel window has been enlarged. The decorations have been carried out under the architects' supervision by Messrs. R. E. Lucas & Co., Preston. On each side of the tower doorway is a cluster of caps, carved with natural and conventional foliage by Mr. H. T. Miles. The heating apparatus has been enlarged. Exclusive of the reredos, 112*l.* have been expended.

Rogate.—The parish church, which during the last sixteen months has been rebuilt, with slight exceptions, has been re-opened. The old church was built in 1160, and one of the arches of the original structure is still left standing. It is said to be a fine specimen of Norman architecture. During the progress of the work, some interesting relics were discovered, amongst them a stone cross of the fourteenth century, and one previously to that date. The latter has been worked into the south wall beneath the tower. The architect was Mr. Penford, of Westminster; the builders were Messrs. Lewis, of Westmeon; the clerk of works was Mr. Charles Bridger, Haslemere; and the foreman of works, Mr. W. Bridger. Some of the work has been entrusted to local tradesmen; the windows, with the exception of the east, to Mr. Othen, of Midhurst. The hot-water apparatus is by Mr. Toop, of Rogate.

Christleton.—The parish church at Christleton, which is now in a very dilapidated state, is shortly to undergo considerable improvement. Its exterior defects are hidden by a mantle of ivy, which gives to the church a rustic and venerable appearance. In the inside the pews are so narrow that to sit in them with comfort is difficult. There is a fine arch in the east wall of the tower, which some church restorer of the past has blocked up with an ugly gallery, shutting out the west window. As so many alterations were suggested, it was decided to consult an architect, who advised the parishioners to entirely rebuild the body of the church, but to preserve the tower—which is in a tolerably good state of preservation, having been built in the sixteenth century. The following tenders have been received for the restoration, according to drawings supplied by Mr. Butterfield, the architect:—

Cooke & Moulton	£8,278	0	0
Wood	7,770	0	0
Readdie	7,749	0	0
Thompson	7,345	0	0
Roberts	6,991	0	0
Holland	5,489	0	0

Since added for tower, 577*l.* Lowest estimate, 6,066*l.*

Eccles.—The ancient parish church of St. Mary, which has been closed for three months for internal repairs, has been opened by Earl Mulgrave. The whole of the plaster and whitewash has been removed, and the red sandstone walls were cleaned and repointed. The modern walls have been tooled and pointed. New oak screens have been placed on each side of the chancel. The pulpit has been lowered and provided with new oak steps. The gas-brackets and communion standards have been burnished and decorated, a new stone chancel-arch has been introduced; oak wall-boarding, shoulder-high, has been carried round all walls where they abut against the seats; and the ancient monument in the Ellesmere Chapel has been cleaned and painted in heraldic colours. The east wall of the chancel has been decorated by Hardman, of London, from designs furnished by the architects, Messrs. Maxwell & Tuke, of Bury, under whose guidance all the works have been conducted.

HEIGHT OF ROOMS.

Sir,—A paragraph at the foot of p. 686 of the *Builder*, headed "Houses unfit for Habitation," in which the height of the rooms of the houses referred to is stated to be only 6 ft., leads me to suppose that it may not be generally known that local authorities have not, legally speaking, any power over the height of rooms in new buildings. Hitherto, as you are aware, it has been customary to include in every series of building by-laws, a clause regulating the height of rooms intended for habitation; but such a by-law is no longer allowed by the Local Government Board, as, on legal authority, it is declared to be *ultra vires*, the height of a room having, as is alleged, nothing to do with ventilation. I could instance many cases in which such a by-law, having been proposed by local authorities, has been struck out by the Local Government Board, and the endeavours of those who know the value of the regulation to get a special clause inserted in the new Sanitary Act have failed. A Surveyor.

RECOVERY OF COMMISSION FOR SALE.

THORNHILL *v.* CARTER.

This was an action, before Mr. Justice Brett and a common jury, by an estate agent to recover the sum of 500*l.* as commission on the purchase of an estate. The plaintiff had offered the defendant (a retired officer in the army) an estate in Buckinghamshire on his signing a "bonus-note," as it is called, in these terms:—"That, provided he purchased the estate, he would pay, by way of bonus, the sum of 500*l.*" The plaintiff then gave the defendant information of the estate, which the defendant afterwards purchased, and the plaintiff then claimed the 500*l.*, which the defendant declined to pay, on the ground that he had, on the first negotiation with the plaintiff, declined to purchase, and had afterwards entered into direct negotiations with the owner, whose agent the plaintiff was not.

Mr. Murphy, Q.C., and Mr. Lumley Smith were for the plaintiff; Mr. De Michele was for the defendant.

The defence set up was that the contract was when the defendant declined to purchase put an end to before the estate was bought by the defendant for 19,000*l.*; but

The Judge told the jury that there was no defence, as there was no revocation of the contract by mutual consent.

Accordingly, the verdict was entered for the plaintiff for 500*l.*

The Future Management of the Institute of Architects.—The committee appointed to inquire as to this have now completed their report. We understand that they are not unanimous.

THE POPULATION OF TYNDALL'S BUILDINGS.

Sir,—My attention has been directed to a paragraph in your last number, in which objection is taken to the accuracy of the number of persons returned as living in Tyndall's-buildings, Gray's-inn-lane, given in the schedule forming part of my report on the application of the Artisans' Dwellings Act to this portion of the metropolis.

I have to inform you that the Metropolitan Board of Works, who, as the Local Authority, are charged with the execution of the Act, are at this moment engaged in taking the numbers of those living in this and the other courts and alleys affected by my improvement scheme; and that, in due course, the result of their labours in this particular will be made public.

I have no wish to anticipate the return now being made by the local authority, but would simply remark that it will be valueless, unless the numbers are taken late at night (certainly not earlier than the closing of the publichouses), until which time the habitations proposed to be removed under the provisions of the Act do not receive their full complement of occupants.

A considerable per-centage must also be added to the total arrived at, owing to the exodus which takes place at this season of the year for harvesting, the majority of those who leave London for this purpose also assisting at hop-picking. It is well known that large numbers of men, women, and children, migrate from Gray's-inn-lane into Kent and Surrey, at this time, with the object I have stated.

Meanwhile if Lord Shaftesbury and Mr. Payne would like to learn how some of the rooms in Tyndall's-buildings are occupied, let them visit the ground-floor of No. 1, where they will find the following persons living in one apartment:—

John O'Donnell, aged 43.
Hannah O'Donnell, aged 40.
John O'Donnell, aged 18.
Patrick O'Donnell, aged 15.
Jeremiah O'Donnell, aged 14.
Daniel O'Donnell, aged 13.
Honora O'Donnell, aged 7.
Margaret O'Donnell, aged 4; and
An infant 6 weeks old.

I am not ungenerous enough to say that this is to be taken as a sample of the whole, nor would I attempt to deduce from this example the moral *ex uno disce omnes.*

But that there is an amount of overcrowding even in Tyndall's-buildings, of which the president and secretary of the Society for Improving the Dwellings of the Labouring Classes little dream, I am as certain as that it exists to a still greater extent in the courts and alleys by which it is surrounded. Lewis H. Isaacs.

Miscellanea.

St. Thomas's School-Chapel, Flint Common.—The opening of St. Thomas's School-Chapel, the foundation-stone of which was laid on Whit Tuesday, 1874, took place on the 4th inst., and the ceremony was very imposing throughout. The morning service was attended by a large congregation from the parish of Flint and surrounding parishes. The building consists of a nave, chancel, vestry, and north and south porches, affording accommodation for 300 worshippers, and 230 children when the edifice is used as a school. Being built of local stone, with buttresses, the appearance is substantial. The style is Early English. The chancel is separated from the nave by a wall of unpolished Halkyn marble, having a coping and plinth of the same material, but polished. The chancel gates are of wrought-iron and polished brass; the lectern is of polished brass. There is a stained glass window in the east end, set up in memory of James Eyton, some time town clerk of Flint, and Mary, his wife, and of Sophia Eyton, late of Cornist. The architect, Mr. John Hill, of London, was presented with an épergne, in recognition of his services as architect.

Lillie Bridge Skating Rink Club.—A new club has been formed under this title, the Duke of Montrose being the chairman of the committee. The club has taken premises next to the polo ground at Lillie Bridge, and has already erected a large tent for the accommodation of the skaters belonging to the club. The committee are now arranging for the erection of a permanent building, with club premises in front, which we are told is to be built after the style of a Swiss chalet. Mr. Walter Emden is the architect employed.

The Sussex Archæological Society.—The annual meeting of the Sussex Archæological Society was held at Lewes last week. One of the chief points of interest was a loan museum arranged in the county hall, in which there was a collection of tapestry, formerly the property of the Duke of Newcastle, and presented to the Society some years since by Lord Chichester. A collection of Celtic, Roman, and other coins, collected in the county, was also on view as well as several valuable books, manuscripts, and relics, among them being the ancient staves of office used by the high constables and head boroughs of Lewes. The places visited included Lewes Castle, built by William de Warrenne, several churches in the town containing ancient monuments, as well as other buildings, and, of course, Southover Church, with the Gundrada Chapel, containing the remains of William de Warrenne and Gundrada, his wife, all well-trodden ground offering no hopes of novelty. The dinner was held in a large tent erected in the Priory grounds, which was a point of considerable interest, as being the site of the ancient and extensive priory of St. Pancras. The dinner was presided over by Mr. J. G. Dobson, M.P.

The Hermann Monument.—The Hermann Monument, near Detmold, was inaugurated in the presence of 40,000 people. Her von Bandel is the sculptor. The *Times* correspondent says,—The statue is described as an imposing work of art; 80 ft. high from the point of the uplifted sword to the legionary eagle trodden under foot by the victor. This gigantic Hermann in form and countenance is intended to impersonate the frankness and strength attributed to the ancient Germans by their Roman enemies. His costume, being the old Saxon tunic, with bear-skin mantle and helmet, leaves arms and legs uncovered, and gives full effect to the huge proportions of this the tallest figure erected since the Rhodian Colossus. The circular cupola temple, which forms the pedestal, is 89 ft. high, and is supported by a foundation 66 ft. in diameter. The figure, being of chased copper, derives solidity from a complicated system of iron tubes placed in the centre of the body. The copper used in making the statue weighs 237 cwt., the iron, 1,133 cwt. A national reward has been conferred upon Herr von Bandel.

Fatal Accident at Bishop Auckland.—The new building which is in course of erection in Newgate and Victoria streets, Bishop Auckland, for Mr. George Moore, and which is intended for a large commercial hotel, was on the 13th inst. the scene of a fatal accident. A large number of men are employed on the work, and the building is nearly ready for the roof. Three young men, named Watson, Patterson, and Durkin, were engaged above the second floor on a scaffold, building up a chimney-breast. They were attended to by a man named James Brown. By some means unknown the wall below them gave way, letting out the joists, when the scaffold fell, and the men, together with the scaffold and about 15 ft. of the wall, were precipitated into the cellar, a distance of nearly 30 ft. The fallen *débris* had smashed out nearly every joist in both floors. Brown was killed and the other three men sustained serious injuries.

The Pease Statue at Darlington.—The bronze statue to be erected in Darlington to the memory of Joseph Pease was successfully cast, on the 14th inst., at Messrs. Cox & Son's foundry, Thames Ditton. The statue is to be placed in a conspicuous part of Mr. Pease's native town, Darlington, the birthplace of the railways of the world. The unveiling will take place on the fiftieth anniversary of the running of the first passenger train, the 27th of September next, on which day the "Railway Jubilee" is to be celebrated at Darlington. The statue itself will be erected on a pedestal 9 ft. high, of finest axed granite, having four bronze panels at the sides delineating the various phases in Mr. Pease's eventful career,—1, emancipation; 2, education; 3, his political and Parliamentary career; and 4, mining and railways. The work will cost about 3,000*l.*

Savile Park Building Club, Halifax.—A scheme is on foot for the erection of a large number of dwelling-houses, of various sizes, near to Savile Park. The buildings are proposed to be erected on the club principle, of a certain deposit down, and the remainder by instalments. The first lot are to be nine semi-detached residences, each of the value, with the land, of 1,000*l.*, on the west side of Savile Park-road. The architect is Mr. J. W. Gough.

Pollution of the River Lea.—A Government court of inquiry has just been held at the Local Board offices, at Tottenham, by Col. H. Ponsonby Cox, into a complaint made by the Lea Conservancy Board to the Secretary of State, that the Tottenham Local Board were not carrying their sewage works in compliance with the provisions of the 51st section of the Lea Conservancy Act. The Local Board had provided additional depositing tanks, but made no attempt to filter. There were more than twenty-four places which had sewage outlets into the Lea above Tottenham; fifteen of them using no disinfectant process, three using the lime process, and four irrigating. Mr. Pead, for the Conservancy Board, said his Board declined to recognise any process in particular. The Commissioner said it was requisite that samples should be taken from time to time, and therefore some time must elapse before he could make his official report and decision.

Self-acting Cinder-sifting Ash Closets.—We are glad to find that these closets, made under Morrell's patent, are employed largely for use on ground-floors and yards at gentlemen's houses, and at workmen's cottages in villages. For mills, schools, and institutions in special localities they may be recommended. The principle of the dry-ash closets, the invention of Mr. Conyers Morrell, C.E., consists, our readers may remember, in the utilisation of the house-ashes as a deodoriser. This object is attained by an ingenious but very simple contrivance. The ashes are thrown on a sloping-screener, at the rear of the seat. By an arrangement of levers this screener is moved every time the seat is occupied, and the ash-dust is separated from the cinders, and falls into a receptacle from which it is meted out in the exact quantity required when the seat is vacated. The cinders pass off the screener, and may be again used as fuel.

Sewage Deposits in the Thames.—An elaborate report has recently been issued by Sir Joseph Bazalgette, the engineer to the Metropolitan Board of Works, in reply to a communication addressed to that Board by the Thames Conservancy, alleging that the accumulation of deposit on the river bank opposite Crossness outlet, between 1870 and 1874, amounted to 240,000 cubic yards, equivalent to a depth of between 7 in. and 8 in. spread equally over the bed for three-quarters of a mile. Sir Joseph Bazalgette, while admitting the statement, adds that the increase of deposit is not uniform nor permanent, and the amount of deposit was less by 313,000 cubic yards in 1874 than it was in 1872, showing a natural deepening of the river equivalent to 10 in. between 1872 and 1874. He adds that the evidence goes to show that the sewage discharged into the river at Crossness tends to scour it rather than to form deposit.

The Clock at Holy Rood Church, Southampton.—This clock is now on the point of completion. It has been supplied by Mr. J. Blount Thomas, of the High-street. The dials, fixed in stone rims, weighing about three tons each, are 5 ft. 4 in. in diameter, of solid copper, and weigh each about a hundredweight. The two faces, one in the front of the tower facing the High-street, and the other on the front looking towards Bridge-street, are specially made of opaque glass, the centre being in one piece, and not like most illuminated clocks having four lines from centre to circumference, which at a distance are not unfrequently confounded with the hands. The lighting is on a self-acting principle, turning on and off the gas as required, and is accomplished by six copper lamps, with glasses and reflectors to utilise the rays. Most of the work has been done in the town, by Messrs. Lankester, Buchan, & Thomas; the masonry being by Mr. Bostock.

The New Schools for Darlington.—A meeting of the governors of the Darlington Grammar School was held on Monday, at the School Board offices, Northgate, Mr. David Dale presiding. The plans of the proposed new schools were submitted to the meeting by Mr. Hoskins, architect. It was stated that Mr. Hawkins, the architect of the Charity Commissioners, did not approve of the proposed large hall, which he thought was more a luxury than a necessity. He also objected to the proposed sleeping accommodation. It was stated that the building would cost about 14,000*l.*, of which only 10,000*l.* were subscribed, exclusive of scholarship subscriptions. After some discussion, it was decided to send the plans back to the Charity Commissioners, to secure the approval of the alterations made.

Mr. Bateman's Proposals for Improving the Ipswich Dock and Navigation.—With respect to the works necessary for improving the dock entrance and the navigation of the river, the Dock Improvement Committee rely upon Mr. Bateman's report and estimates. His minimum estimate includes 40,000*l.* for new lock, with entrance-gates; 16,000*l.* for one dredger, with two hopper-barges; 3,000*l.* for dredging in the lower end of the present dock; 20,000*l.* for dredging in the channel; altogether, including 8,000*l.* for a portion of contingencies, amounting to the total sum of 87,000*l.* But this does not include provision for unloading large vessels at the present merchants' quays, nor for deepening the upper end of the dock, nor for a pair of intermediate gates, to divide the new lock into two; neither does it appear to include the timber jetty, for protecting the entrance to the dock.

The Sanitary State of Hackney.—Dr Tripe has presented to the Hackney Board of Works a report on the sanitary condition of the district. The public health of the district has not been quite so good as in the two previous years. Still, the death-rate is not so high as for all London. The population is estimated at 137,571, being an increase in the decade of nearly 40,000 persons. The density of the population has augmented in the same period from 22·8 to 34·9, and is increasing at the rate of one person per acre per annum. Dr. Tripe says that during 1875–6 a much larger mortality from scarlet fever must be expected. The river Lea has been, and is still, in a very bad state. The overcrowding cases at Hackney were not numerous, but some of them were very bad. The overcrowding was in all these cases quickly remedied.

Banbury Temperance Hall.—Tenders for this hall and buildings were invited from Banbury builders only, and sent in as follows:—C. Claridge, 2,375*l.*; J. & T. Davis, 2,383*l.*; T. & S. Orchard, 2,397*l.*; A. Kimberley, 2,686*l.*; T. H. Kingerlee, 2,875*l.* The committee were divided as to the choice of the lowest two tenders, the difference being nominal, and a consideration of certain matters between the committee and Messrs. Davis (who formerly occupied the property), influenced the decision arrived at to accept their tender as being practically the lowest, and not any preference as to the capabilities of the builders. When builders are invited no question of this sort should be entertained; the lowest tender should be accepted.

The New Law Court, Stafford.—On the 16th inst. was opened the new Police Court. It is more commodious than the old one, and this appears to be the only improvement. The approach to it is by a long, narrow, winding staircase, at the top whereof are two small doorways, and by this passage every one having business at the court must reach it,—magistrates, solicitors, policemen, and prisoners, together with the crowd of visitors, jostling one another *sans cérémonie* in the narrow entrance. The interior arrangements are in keeping with the approach. The accommodation for magistrates, solicitors, and reporters, is at present the same as heretofore. No rooms have been provided for witnesses in attendance or for the magistrates in which to retire to consider their decision.

The Dwellings of the Poor.—Dr. Hardwicke held an inquest on the 16th inst. at the Wellington Hall, Brooke-street, Holborn, on the body of Mary Ann Matthews, aged five weeks, daughter of a barber living at 22, Brooke-street. Mary Ann Matthews, the mother stated that the deceased was her first child, and they lived on the ground floor of the above address, using the front room for business purposes, and the back for a living and sleeping apartment. Mr. T. G. Davis, M.R.C.S., said the cause of death was suffocation from want of fresh air. The coroner said that the statistics showed that under such circumstances three if not four out of six children died, and but for having the run of the streets the others would soon follow. A verdict of "Death from accidental suffocation" was returned.

Explosion of Paraffin from Heat.—On Sunday night an explosion of paraffin occurred on the premises of Mr. J. Smith, oilman, situated at the corner of Rodney-street and North-street, Walworth, by which the basement was destroyed and the shop severely damaged. The explosion was caused by a leakage of paraffin, which ignited in consequence of the heat of the weather.

Shoreham.—A new R. C. church was opened here on the 11th inst. by Cardinal Manning. It is dedicated to St. Peter, and was erected at the sole expense of the Duchess of Norfolk. The church, built in the style of the latter end of the thirteenth century, is of flint with stone dressings, and will accommodate 400 worshippers. Its total length is 90 ft., of which the chancel occupies 30 ft. The altar is sculptured from Painswick stone. It is divided into three arcades, the centre one being filled by a representation of the release from prison of the church's patron saint; whilst symbolic designs, including the crossed keys, the sword of St. Peter, &c., are disposed at various parts. The church was built by Mr. R. Blaker, of Worthing, the architect being Mr. C. A. Buckler, of London. In close proximity to the church schools are being constructed.

Burwarton, Bridgnorth.—Rapid progress has been made in the building of the new church, by Messrs. George Smith & Co., of London, for in a few weeks' time the internal decorations will be completed. It is the gift of Lord Boyne, and is built of a warm-coloured stone, quarried from Burf Hill, close by, belonging to his lordship. The style is Gothic, with a square tower 70 ft. high. The west end of the church from the tower to the chancel is 88 ft., and from north and south aisle 56 ft. The stone carving is executed by Mr. Dayman, of London. The chancel and organ-chamber arches are supported by Purbeck marble supplied by Lord Edon. The reredos over the communion-table will be in mosaic. There are also carved sedilia supported by three marble columns. Mr. Salvin, of London, is the architect.

Building Scheme at Hipperholme.—It is proposed to establish a building-club at Hipperholme, for the erection of first-class dwelling-houses. The site is between the Leeds and Whitehall road and the Hipperholme tunnel, and has extensive views east and west, and large gardens or grounds to the front. Plans have been drawn by Mr. W. H. Howorth, and as the site is about 200 ft. in depth, and is well wooded, it will not only afford extensive but pleasant front grounds, whilst at the back there will be ample room for stables, &c. It is intended to erect two blocks, each containing nine houses, and that the cost of each house shall be between 500*l.* and 600*l.*

St. Stephen's, East Hardwick. — The chancel window of East Hardwick Church, Pontefract, is in the Early English style, and consists of three long narrow lights; the centre one has been filled with stained glass, representing events in the life of St. Stephen, and is the gift of pupils of East Hardwick school. It is proposed to place two figured lights one on each side of the St. Stephen light, to make the window complete. Parallel with the stonework of the window, and as a relief to the border, there is a line of semi-transparent glass set in squares, on which are shown small patterns of monograms, &c. Messrs. Edmundson & Son, of Manchester, are employed.

Burton-upon-Trent.—On Monday afternoon the two principal foundation-stones of the proposed new Wesleyan chapel and schools, Horninglow, were laid with the usual ceremonies. The site of the new structure is that of the old chapel and additional land in the rear, and the erection has been entrusted to Mr. Potter, of Horninglow-road, from plans prepared by Mr. Wills, of Derby. It is intended to accommodate 200 persons, and to be supplemented by two school-rooms and a class-room. The building will be of brick, with wrought Derbyshire stone dressings, and, with the cost of extra land, will represent an outlay of about 1,000*l.*

Proposed Restoration of Flyford Church, Worcestershire.—A meeting was convened by the rector of Flyford Flavell, on the 3rd inst., to consider what steps should be taken towards the restoration of that church. The following proposition was made and carried unanimously:—"That the body of Flyford Flavell Church be taken down and rebuilt; that landowners be applied to to assist in carrying out this object; and that those who have already promised to subscribe be applied to for their subscriptions, and that it be paid to the account of the Church-building Committee."

Iron Railing on the Holborn Viaduct.—The railing and gates in front of the City Temple, on the Holborn Viaduct, have been well executed by Messrs. Andrew Handyside & Co., of Walbrook.

Hadleigh.—The opening services of the Primitive Methodist new chapel and school-room here have been held. The chapel is a substantial red brick building, with white dressings to the doors and windows, and roofed with slate. There is a neat lobby; the benches have reclining backs; and there is also a rostrum. The floor is boarded. The chapel is lighted with eight circular-headed windows. The woodwork inside is finished with a light oak stain, varnished. Accommodation is provided for about 250 persons. The schoolroom is about 28 ft. by 14 ft. inside, carried up to the same height as the chapel, with bond, &c., for the ground-floor, when needed. It is fitted with gas, fireplace, cupboards, with provision for hot water for persons who may stay to dinner on the Sabbath, and for tea-meetings. The design of the buildings and specifications were by the Rev. M. Warnes, the late minister; and Mr. W. Baalham was the builder.

Improvement of Birmingham.—*On dit* that one of the newest projects for the improvement of Birmingham is one of the boldest that has yet been thought of. It is nothing less than an immense boulevard, which, stretching in a north-easterly direction from the neighbourhood of the New-street railway station, would sweep away a number of the "back slums" in its course, and give a wide and noble thoroughfare, bordered on each side with trees, &c., in the Parisian style, in their stead. The carrying out of this project, says the *Birmingham Gazette*, would also afford an opportunity for an extensive application of the Artisans' Dwellings Act.

A Window Improvement.—In the Sanitary Department of the Yorkshire Exhibition, Leeds, is exhibited what is called the "Sanitary Window," patented by Mr. J. James Consins, banker. Besides the advantage of being free from rattling or shaking in stormy weather, the patentee says this window can be wound up with ease and quietness by a young child, whilst the strongest man is unable to force either sash up or down unless by using the key, the simple withdrawal of which firmly locks the apparatus. The window requires no pulley or cords, and obviates the nuisance caused by upper sashes getting out of order.

A New Unitarian Church at Coseley.—The opening services in connexion with the new Unitarian Church took place on the 10th. In October last, the building of the new church was commenced by Messrs. G. & F. Hyam, Wolverhampton, from plans prepared by Messrs. Bidlake & Fleeming, architects, of the same town. The new erection is in the Gothic style of architecture of the thirteenth century, and is built of stone. It affords accommodation for about 300 people. The total cost was about 1,600*l.*, all of which has been subscribed.

Sale of the Hotel du Louvre.—The immense block of buildings in the Rue de Rivoli, known as the Hôtel du Louvre, in Paris, was sold on the 14th inst. As had been previously announced, it was put up at 15,000,000 francs, and 2,500,000 francs for the goodwill of the business. M. Benoit, representing MM. Chauchard & Heriot, proprietors of the Grands Magasins du Louvre, bid 50 francs, and was declared the purchaser. The new owners are stated to have the intention of continuing the business as at present conducted. The costs are not included in the 17,500,050 francs.

Reduction in the Price of Gas.—Through the efforts of Mr. Applegate, the Trowbridge Gas Company's tariff has been reduced both to public and private consumers. The contract price for lighting the streets is to be 2*l.* 15s. per lamp, or a reduction of 5s. on each lamp. This will effect a saving of about 50*l.* in this year's contract. The price of gas to private consumers is to be reduced from 4s. 7d. to 4s. 2d. per 1,000 cubic feet, the reduction to take effect from the 1st of July last.

Gas Explosion at a Hospital.—An explosion of gas took place on the 16th inst., in the matron's room at the North Cambridge Hospital, Wisbeach. Two persons were seriously burnt, the windows were blown out, and great damage was done to the room. The explosion was caused by the porter, who, being called to an escape of gas, struck a match to look for it. When will people understand that to apply a light to escaping gas without first opening windows and doors, is the same as applying it to gunpowder?

Property and Trade Income.—In 1814 the gross value of lands and houses, &c., including quarries, mines, ironworks, canals, gas-works, and railways, in Great Britain, was 60,138,330*l.*; in 1844, 95,300,248*l.*; in 1854, in the United Kingdom, 124,871,885*l.*; in 1864, 161,397,345*l.*; and in 1873, 212,922,851. The gross annual incomes from trade, professions, &c. (excluding the provisions of 29 Victoria, cap. 36) were in the same periods,—from 1814 to 1873,—respectively 37,058,989*l.*, 65,095,191*l.*, 91,280,131*l.*, 124,075,550*l.*, and 197,237,339*l.*

Florentine Needlework.—In his "Ariadne Florentina," just published, Professor Ruskin gives a description of three pieces of Florentine needlework, which attracted his attention in the bedroom in which he slept at the King's Arms Hotel, Lancaster. The Professor, while staying at this old inn, was engaged in revising a lecture on "Design in the Florentine Schools of Engraving." It was in this inn, also, if we remember rightly, that Dickens and Mr. Wilkie Collins wrote one of their joint stories.

A Relic at the Thames Embankment.—The workmen engaged in clearing out the foundations for the new opera-house on the Thames Embankment at Westminster, have discovered, at a depth of 35 ft., a sword of curious workmanship. It is said to have a handle of gold, covered with heraldic engravings, and apparently of about the time of Edward II. or III. The blade is of fine Spanish temper, is straight, and double-edged, and is still sharp, although much disfigured with rust.

The Paving and Lighting of London.—Early next session Sir William Fraser will call attention in the House of Commons to the paving, lighting, and cleansing of London, and move that, in the opinion of this House, the parochial system is unsuited and inadequate to the reasonable requirements of the inhabitants of the metropolis, and that the subject deserves the immediate attention of Her Majesty's Government, with a view to remove by legislation the great evils that at present exist.

New Docks at Dundee.—A wet dock named the Victoria in honour of the Queen, was formally opened at Dundee on the 16th inst. by Lord Strathmore, the lord-lieutenant of the county. The new works have cost upwards of a quarter of a million, and the sum expended on the harbour from first to last has been nearly a million. Lord Strathmore said the Queen had intended to be present, but had been reluctantly obliged to forego the pleasure. Four launches took place, and the proceedings passed off with great success.

German Art Education.—An annual sum of 40,000 thalers has been granted by the German Government for the carrying out of the proposed project of having plaster casts taken of all the most important monuments of architecture and sculpture in Italy. The Italian Government has given permission for this work under certain conditions, one being that a copy of every one of the works reproduced should be given towards the formation of a museum of casts in Italy.

West Bromwich.—A new Town Hall and public buildings, comprising commissioners' offices, free library, open and covered markets, and public baths, erected at a cost of some 30,000*l.*, have been formerly opened at West Bromwich, when a dinner in honour of the occasion was given by Mr. R. Farley, the chairman of the Local Board of Improvement Commissioners.

The Science and Art Department.—We understand that the appointment of Art Director of the Science and Art Department, vacant by the resignation of Mr. R. Redgrave, R.A., has been offered by the Committee of Council on Education to Mr. E. J. Poynter, A.R.A., Slade Professor at University College, London, and are glad to hear that it has been accepted by him.

An Irish Home.—A sanitary officer from Clare reports having found ten human beings in a tottering mud edifice, 13 ft. by 7 ft. Seven slept in one bed, and a younger member in a hencoop. The roof was decayed and riddled with holes, and a dung-hill of putrid matter outside emitted a terrible stench. One child was quite naked. The family had been receiving out-door relief.

Extensive Alterations at the Hamilton Barracks, Scotland.—The policy adopted by Government in concentrating certain districts of the country into military depôts has led to great alterations in the barracks at Hamilton. The buildings for which contracts have been accepted by the War Office include quarters for fifty-six married soldiers. The total cost of the proposed additions is roughly stated at 20,000*l.*

New Wesleyan Chapel at Chesterton.—On the 16th inst. memorial stones of a new Wesleyan Chapel, at Chesterton, were laid. The chapel is being built by the Rose Hall Brick and Tile Company, from the designs of Mr. G. B. Ford, of Burslem, and it will seat 500 people. The entire cost, including 400*l.* for the site, will be 2,400*l.*

Monument to the late Mr. Platt, M.P.—Mr. D. W. Stevenson, sculptor, Edinburgh, has been selected to design the public monument,—a bronze figure with granite pedestal,—proposed to be erected at Oldham in memory of the late Mr. John Platt, M.P., the inventor and manufacturer of cotton-spinning machinery, to whom Oldham is indebted for a school of science and art.

Lighting Malmesbury Abbey.—This building is now lighted up with gas, the fittings and burners being arranged on the same principle as those of Gloucester Cathedral. The work has been carried out by Mr. Gough, of Westgate-street, Gloucester. The burners are placed in the cornice, above the pillars in the nave, and continue on both sides along the entire length of the building.

New Mission-room, Bradford.—Mr. B. Wood, of Frizinghall, has just had completed at his own cost a building to be called St. John's District Mission, which will be used as a day and Sunday school, and for the celebration of divine worship. The cost of the structure is about 1,800*l.*, and it will accommodate 330 children.

The Extension of the Western Piers, Swansea.—It was decided at the meeting of the harbour trustees, held on Monday last, that the important work of extending the piers another thousand feet will be forthwith proceeded with. The work will be carried out by the Harbour Trust themselves, and the total estimated cost is about 30,000*l.*

Want of Sewers in St. Pancras.—At a meeting of the St. Pancras Works Committee, on the 9th inst., Mr. W. B. Scott, the chief surveyor, reported that there was no sewer in Diana-place, Euston-road, and suggested a continuation of the sewers in the locality, at an expense of 440*l.*, which was agreed to, as also improvement of the sewerage in the Junction-road, at a cost of 460*l.*

New Schools in Kensington.—Princess Mary of Cambridge has laid the corner-stone of a second set of Church of England schools in the parish of St. Clement, Kensington Potteries. The schools are intended for about 700 children. The architect is Mr. F. Rogers, who expects to have the buildings completed at the rate of 3*l.* 10s. per child.

A Village Destroyed by Fire.—On the 13th inst. the village of Chudleigh Knighton, Devon, was in great part destroyed. Some children experimenting with a box of fusees set fire to a cottage, and before help could arrive not only was it entirely destroyed, but many others were much damaged.

The Old Baptist Chapel, Guildford.—The Old Baptist Chapel, in South-street, is being rebuilt with the addition of a schoolroom, and on the 13th inst. the memorial-stone was laid by Mr. W. Crowther, of Gomersall, Leeds. The building will cost about 700*l.* Messrs. Ayling & Jenkins are the builders.

Sowerby.—Increased chapel and school accommodation being required at Steep-lane Baptist Chapel, the congregation have erected and opened a new chapel to seat 600 persons, and a school, with class-rooms, to accommodate 350 scholars. The total cost of these has been about 2,500*l.*

The Foresters' New Hall, Bridport.—The foundation-stone in connexion with a Foresters' New Hall was laid on the 12th inst., by Mr. P. Ralli, M.P. for Bridport. For some time, owing to the large increase of brothers, there has not been sufficient accommodation at the old court-room, and hence this step was rendered necessary.

New Union Church at Lenzie.—A new church, built at Lenzie, for the use of the Union congregation, of which the Rev. Mr. Miller is pastor, at a cost of over 3,000*l.*, has been opened. The church is in the Gothic style, and has been seated in the area as well as in the end gallery, for about 600 persons.

The Management of Epping Forest.—Three important schemes have been forwarded to the Epping Forest Commissioners for the future management of the forest from the Corporation of the City of London, the Metropolitan Board of Works, and the Forest Fund Committee.

Norton Parish Church.—The tender of Mr. W. Fream, jun., builder, for the restoration of the ancient parish church of Norton, has been accepted. Tenders were sent in by three other firms. The work will be at once proceeded with, and is expected to occupy about four months.

The New King's School, Chester.—The large space of ground in front of the Town-hall, selected as the site for the new King's School, has been handed over to the contractor, Mr. Farrimond. On the 9th inst. the work was formally commenced.

Mr. Edward Newton, architect, of 104, Queen Victoria-street, E.C., writes to explain that he is not the Mr. Newton concerned in the case of "Newton *v.* the *Hornet*."

TENDERS

For warehouses, &c., in Clavering-place, for R. Robinson & Co., Newcastle-on-Tyne. Mr. J. E. Watson, architect:—

Whichillo	£4,850	0	0
Jackson	4,400	0	0
Scott	4,395	0	0
J. & W. Lowry	4,383	0	0
Simpson	4,327	17	1
Kyle	4,300	0	0
Norvel	4,234	0	0
Messrs. Mitchison	4,156	0	0
M'Mullan	3,966	1	4
Harbottle	3,964	19	10
Lee	3,809	9	0
Elliott	3,785	0	0
Grisdale (accepted)	3,718	0	0

For Long Eaton Working Men's Co-operative Stores, Derbyshire. Messrs. Robert Clarke & Son, architects:—

Hodson & Facon	£5,197	0	0
Slight	4,890	0	0
Jelley	4,913	0	0
Messom	4,749	0	0
Vickers	4,690	0	0
Slim	4,390	0	0
Duke	4,370	0	0
Poxen (accepted)	4,300	0	0

For the rebuilding of Moyriesk House, near Quin, county Clare, for J. F. Vesey Fitzgerald, D.L. Mr. W. Fogerty, architect. Quantities by Messrs. Gribbon & Butler:—

Gahan & Son	£2,800	0	0
Carroll	2,780	0	0
Wallace	2,680	0	0
Ryan & Son	2,591	0	0
J. & J. Hayes (accepted)	2,373	0	0

For works to premises, Burlington-street. Mr. S. Dyball, architect:—

Lister	£1,598	0	0
Abraham	1,584	0	0
Merritt & Ashby	1,548	0	0
Falkner	1,511	0	0
Kelly, Brothers	1,496	0	0
Scrivener & White	1,444	0	0
Rudkin	1,435	0	0
W. & F. Croaker	1,397	0	0

For villa residence, Sydenham. Mr. B. Fletcher, architect:—

Jerrard	£1,697	0	0
Fish	1,691	0	0
Brass	1,650	0	0
Kilby	1,620	0	0
Patrick	1,589	0	0
Hill, Higgs, & Hill	1,569	0	0
W. & F. Croaker	1,459	0	0

For repairs and alterations to St. Mark's Church, Tollington Park, N. Messrs. W. Waymouth & Son, architects:—

Dove, Brothers (accepted)	£745	0	0

For new Lecture Hall and alterations at the Strood Workmen's Club and Institute. Mr. Bulmer, architect:—

Ames	£1,050	0	0
West	900	0	0
Wilkins & Son	850	0	0
Callmed (accepted)	850	0	0
Sollitt	779	0	0

For basement story, coal vaults, and foundations to master's house, and men's infirm wards, at Marylebone Workhouse, for the guardians of St. Marylebone. Mr. H. Saxon Snell, architect. Quantities by the architect and Mr. Robert Griggs:—

Croaker	£2,230	0	0
Bamford	2,050	0	0
Aitchison & Walker	1,955	0	0
Wall, Brothers	1,897	0	0
Crockett	1,849	0	0
Hart	1,825	0	0
Dunkley	1,795	0	0
Timewell (withdrawn)	1,660	0	0

For new sewer between the London, Chatham, and Dover Railway and Southwark Bridge, in the City of London, for the Metropolitan Board of Works:—

Mowlem & Co.	£29,900	0	0
Webster	29,250	0	0
Nowell & Robson (accepted)	26,500	0	0

For alterations and additions to No. 85, Holland-road, Kensington. Mr. William S. Cross, architect. Quantities supplied by Mr. Joseph Waghorn:—

Kinnimont	£844	0	0
Howard	787	0	0
Richards	754	0	0
Weekes	625	0	0
Thompson	575	0	0

For the erection of a manufactory in Bromley, Middlesex, for Messrs. A. C. Engert & Co. Messrs. Hills & Fletcher, architects. Quantities supplied:—

Patman & Fotheringham	£5,250	0	0
Perry & Co.	5,198	0	0
Abraham	5,180	0	0
Sheffield	5,125	0	0
Wood	4,975	0	0
Bangs & Co.	4,725	0	0
Grover (accepted)	4,494	0	0

For alterations to East London Soap Works, Bow, for Messrs. Edward Cook & Co. Messrs. Hills & Fletcher, architects. Quantities supplied:—

Bangs (accepted)	£1,700	0	0

For additions to house in Bow-road, for Dr. Batteson. Messrs. Hills & Fletcher, architects:—

Craig	£169	10	0
Barrow	165	10	0
Selby (accepted)	159	0	0

For office fittings, 17 and 18, Basinghall-street. Mr. Wm. C. Banks, architect:—

	For new fittings.	Allowance for Old Materials.
Drew	£162 10 0	£22 10 0
Colls	157 10 0	7 10 0

For additions and alterations to "Glenthorne," The Avenue, Upper Richmond-road, Putney, for Mr. S. Merriman. Messrs. Karslake & Mortimer, architects. Quantities by the architects:—

Hobson	£760	0	0
Adamson & Sons	750	0	0
Aries (accepted)	731	0	0

For the erection of a detached residence in Upper Richmond-road, Putney, for Mr. R. Heath. Mr. S. Wood, architect. No quantities:—

Davies	£2,935	0	0
Aries (accepted)	2,547	0	0
Sutton	2,260	0	0

For new Presbytery, Tyler-street, North-East Greenwich. Mr. Henry John Hansom, architect. Quantities prepared by Mr. Henry Smith:—

Dove, Brothers	£1,695	0	0
Smith	1,599	0	0
Lathey, Brothers	1,520	0	0
Gregory	1,493	0	0
Tyerman	1,449	0	0
Beale (accepted)	1,118	10	0

For the erection of a cottage in South Penge Park, for Mr. Gilson. Mr. H. S. Benison, architect:—

Iles (accepted)	£600	0	0

For alterations and additions to the Lord Nelson, Nelson-square, Blackfriars-road (second tenders). Messrs. Ingram & Hollands, architects. Quantities supplied:—

Abraham	£759	0	0
Moreland & Nixon	730	0	0
Cook & Green	722	0	0
Patrick & Son	684	0	0
Harris & Wardrop	612	0	0
Hunt (accepted)	584	0	0

For erecting premises on the site of Nos. 68 and 69, Old Bailey, for Messrs. Larington. Mr. Thomas Renton, architect. Quantities supplied by the architect:—

Hill, Higgs, & Hill	£7,650	0	0
Newman & Mann	6,864	0	0
Morter	6,683	0	0
Scrivener & White	6,669	0	0
Nightingale (accepted)	6,647	0	0
Foster (withdrawn)	5,797	0	0

For new vicarage at Hampstead. Mr. T. K. Green, architect. Quantities supplied by Mr. Charles Poland:—

Burford	£3,159	0	0
Merritt & Ashby	2,999	0	0
Downs & Co.	2,980	0	0
Dove, Brothers	2,975	0	0
Browne & Robinson	2,970	0	0
Scrivener & White	2,900	0	0
Cowland	2,880	0	0
Waldram & Co.	2,856	0	0
Sharpington & Co.	2,832	0	0
Adamson	2,694	0	0
Newman & Mann	2,670	0	0

For new warehouse in Farringdon-road, for Mr. A. Burton. Mr. G. B. Williams, architect. Quantities supplied by Messrs. Franklin & Andrews:—

Turner & Sons	£10,881	0	0
Clemence	9,947	0	0
Conder	9,266	0	0
Ashby & Horner	9,100	0	0
Patman & Fotheringham	9,085	0	0
Macey	9,038	0	0
Ashby, Brothers	8,982	0	0
Lucas	8,965	0	0
Browne & Robinson	8,937	0	0
Coleman	8,888	0	0
Newman & Mann	8,834	0	0
Brass	8,664	0	0
Little	8,630	0	0

For alterations and additions to Nos. 44 and 45, King's-road, Brighton, and the erection of an Art Gallery and other works, for Messrs. Lewis & Sons. Mr. Thomas Lainson, architect. Quantities supplied by Mr. John George Gibbons:—

Barnes	£6,775	0	0
Newman & Mann	6,560	0	0
Merritt & Ashby	6,400	0	0
Cheeseman & Co.	6,130	0	0
Chappell	5,061	0	0

For dwelling-house and shop, No. 38, Hanway-street, Tottenham-court-road, for Mr. W. H. Parker. Mr. Alfred Skingle, architect. Quantities supplied:—

Weeks & Son	£1,180	0	0
Ellis	1,096	0	0
Scrivener & White	1,085	0	0
Newman & Mann	1,066	0	0
Deards	1,064	0	0
Niblett	1,041	0	0

For the formation of a new road, 70 ft. wide and 2,675 ft. in length, and sewer under, upon the estate of Sir John Maryon Wilson, bart., and Mr. Spencer Maryon Wilson, Hampstead:—

Anderson	£9,991	0	0
Hiscox	£9,500	0	0
Killingback	9,490	0	0
Watts	9,475	0	0
Nowell & Robson	9,225	0	0
Culverhouse (accepted)	8,987	0	0

The tender of Messrs. Gunyan & Son (Oxford Steam Works), for the whole of the blinds to the Convalescent Home for Children at Norbiton (Mr. H. Saxon Snell, architect), has been accepted.

TO CORRESPONDENTS.

E. A. J. B. (an area 1,369 ft. by 700 ft. is not an incorrect expression. Information as to the new docks and extension works at Portsmouth is by no means willingly afforded).—Isca (the Building Act provides a mode of proceeding. Take proper advice).—J. D. & Sons.—E. W. T.—A. F.—W. B.—W. A.—J. C. H.—E. P.—J. M.—R. L.—H. H.—R.—J. B.—C. & Son.—M'L.—C. S.—H. B. W.—J. L.—B. A. P.—S. J. (in type).—J. K.—C. Z.—T. W. A.—S. & A.—W. C. B.—R. S. W.—J. G.—E. C.—J. S.—E. L.—C. Y.—W. B. (send particulars).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, list of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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DAYLIGHT IN DARK ROOMS

BY MEANS OF

Chappuis' Patent Reflectors.

MANUFACTORY:

69, FLEET STREET.

The Builder.

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ILLUSTRATION.

Premiated Design for the German Parliament House, proposed to be Built in Berlin.—By Sir G. G. Scott, R.A., in conjunction with his Son, Mr. J. O. Scott 776, 777

CONTENTS.

Congress of the British Archæological Association 765
Sanitary and Industrial Results of the Session: British Money Abroad 767
The Furniture Renaissance in France 768
French Criticism on the Art of Punch 769
A Hitch in the Lambeth New Infirmary Contract 769
Sale of Fairlawn Cottage, Kew-green 769
Enlargement of the Hastings Infirmary 769
Houses in the Philippine Islands 770
New Liberal Club in Warrington 770
French Association for the Advancement of the Sciences 770
The New Reservoir for the Liverpool Waterworks, at Rivington 770
Convention of the American Institute of Architects 771
The Building Trade in Maine, United States 772
Improved Plastering for Brick Walls 772
School Board Economy 773
Cardiff and its Prospective Improvements 773
The West Bromwich Public Buildings 774
Premiated Design for the German Parliament House 774
Effect of Blows on Iron 774
Protection from Lightning 779
Abandoned 779
Ramble of an Invalid 779
Inspection of the Coventry Sewage Works by the Government Commissioners 779
Handrailing 780
Sudden Death of an Architect 780
Unsanitary Signs 780
The Cambrian Archæological Association 780
Hydraulic Lifts for Canal Vessels 780
The Removal of the Sea 780
Inland Naval Arsenals 781
General Foremen and Clerks of Works: Bricklayer v. Carpenter 781
The Widening of London Bridge 781
Liability to Repair Roads: The Kensington Vestry v. The Vestry of St. Margaret and St. John, Westminster 781
Strike at Tunstall 781
Solidified Cement 781
Claim for Personal Injuries: Important to Builders 781
A Sub-Contractor in a Fix 781
Church Building News 782
Watertight Ponds 782
Dissenting Church-Building News 782
New Assize Courts at Newcastle 783
Sale of Perdiswell Hall 783
The Opening Address: British Association for the Advancement of Science 783
The Star Theatre and Music Hall, Bradford 783
Bursting of a Reservoir at Cardigan 783
The Ruins in Iona 783
Cases under Metropolitan Building Act 783
Architects' Responsibilities: Frangnell v. Stratton 783
Sanitary and Æsthetic Schools Wanted 784
From Australia 784
Books received 784
Miscellanea 784

Congress of the British Archæological Association.

THE Evesham Congress must be pronounced very successful, and the proceedings during the week have been so well reported, both by provincial and London papers, that we should be telling a twice-told tale if we were to follow minutely the steps of the party. We shall confine ourselves to a point or two here and there.

Stratford-on-Avon.

The Mayor here was particularly happy in his address to the assembled members. It is not, he remarked, too much to say that we regard it somewhat in the light of a duty to welcome so distinguished a body, which numbers amongst its members men to whom Stratford is much indebted, prominently amongst them being the name of Mr. Halliwell-Phillipps. It is one of the sweets of life to turn aside for a time from the whirl of busy ceaseless activities, and seek recreation and repose in a loving contemplation of the genius of our forefathers, enshrined as it is in the countless monuments of this and other lands; and to search for, with filial fondness, those footprints on Time's sands which they have left us, a rich heritage indeed,—bright and ever-burning lamps,—so to speak, which, while they enable us to read the, in some cases, pale-faced handwritings of the past, reflect, as from some rich antique mirror, light which will enable many a student to inscribe the pages of time present and time to come. Ladies and Gentlemen, while it is the glory of our ancient corporations that they embody the principle of local self-government, which had its origin in a protest against the oppression of feudalism, and thus enshrine all that tends to manliness and self-respect, so in the culture of religious qualities, which, in England's people, have contributed more than anything else to England's greatness, they faithfully and wisely conserve and represent all that is oldest and best in the past, and foster and cherish what is newest and most worthy of aspiring to in the present. So is it with associations like your own, which combine a fond, tender veneration for the glorious memories of by-gone years, with an equally earnest longing desire to promote all that can ennoble and elevate mankind in the fleeting present and the peeping future. Permit me to remind you that you have come to visit a town, in size and population small, yet "big to fulness" with historical associations. These records so beautifully, so admirably arranged and tabulated by Mr. Halliwell-Phillipps, by the sanction of the Corporation, and under the care of Mr. Joseph Latimer, the Chamberlain, have been placed on these tables for your inspection. These records will take you back almost to the Conqueror's time. In their pages you will learn what an important Church history Stratford possesses, and most of England's early history is intimately connected with that of the Church. You will read how its present Collegiate Church was built upon the site of one which dated back to Saxon times; of its Chantry of Priests founded by that great ecclesiastic and statesman, John de Stratford, Archbishop of Canterbury; of the College wherein they found a congenial home, built for them by Ralph de Stratford, Bishop of London; of the Guild of the Holy Cross, and its chapel, so greatly indebted to one Robert de Stratford; and of the Grammar School, founded by good Priest Jolyffe.

A Vice-President of the Association responding to the Mayor's kind greeting, expressed regret at the absence, through indisposition, of the Marquis of Hertford and of Lord Houghton. He assured the Mayor and Corporation that it gave the members of the Association resident in London and other places, the greatest satisfaction to see how well the people of Stratford discharged their great responsibility in carefully preserving the antiquarian treasures connected with Shakspeare.

Clopton.

The visit to Clopton House, now the seat of Mr. Arthur Hodgson, after a long examination of Stratford and its old buildings, proved a very interesting and agreeable episode in the day's proceedings. Mr. Hodgson and his lady received a party of about 100, specially invited, at four o'clock, when a *déjeûner* was prepared in a tent erected outside Clopton House, and here, after entertaining his guests in most hospitable fashion (a peculiar feature in the entertainment being specimens of Australian wines), the paintings and Shakspearian relics in the house were inspected, and before retiring Mr. Hodgson read a very entertaining paper on the history of Clopton House, written in a genial vein, and eliciting the unanimous admiration of his audience. Mr. Hodgson, after going into the genealogy of the residents of Clopton House, and tracing the decadence of the Clopton family, mentioned some curious facts illustrative of the enhanced value of real property in modern times. He stated that in 1830 the Clopton estate of 280 acres was sold to a Mr. Lloyd for 16,500*l.* In 1873 he (Mr. Hodgson) bought the estate by auction for 38,000*l.* (more than doubling the value in forty years), exclusive of the value of the timber and the furniture, which in 1824 sold for 57*l.*, but for which he had to pay 8,300*l.* in September, 1873.

The Bell Tower at Evesham.

At the first evening-meeting for papers, Mr. Blashill read a memoir by the Rev. Mackenzie E. C. Walcott, B.D., F.S.A., on "The Mitred Abbey of Evesham." The paper was remarkable for the research which it exhibited. It was illustrated by an excellent plan. One of the most important points raised by the writer was as to the age of the bell-tower, which is commonly assigned to Abbot Lichfield. An elaborate argument was brought forward to prove that it was built about a century earlier, probably by Abbot Zatten, a view which was also taken, he said, by Mr. J. H. Parker.

The Rev. A. H. W. Ingram combated the argument that the bell-tower was not built in Lichfield's time, and quoted from a Latin treatise, written by a monk of Evesham, in the twenty-second year of Lichfield's rule, and translated by Thomas Talbot, a Northamptonshire antiquary of the time of Elizabeth, who added the fact that "in his (Lichfield's) time the new tower of Evesham was built, which as yet is left untouched." He (Mr. Ingram) contended that the tower was more likely to have been built in settled times under the Tudors, than when the Wars of the Roses prevailed.

The Rev. N. G. Batt said there were many instances of a great amount of building having been done during the Civil Wars, as at St. Alban's.

The Chairman (Mr. Godwin) said it was of no use the British Archæological Association coming to the town if such a point as that could not be settled. He would rather trust to masonry than M.S., and suggested a careful examination the next morning, which was agreed upon.

At the following evening-meeting, Mr. Blashill reported that, as arranged on the previous evening, Mr. E. Roberts, Mr. Godwin, himself, and others, who were conversant with the architecture of the period, had examined the bell-tower that morning, to form their own opinion as to its date, and had come to the conclusion that the tradition in Evesham, that it was built by Lichfield, was undoubtedly correct. He was glad to be able to confirm this tradition, and he sympathised with the feeling that prevailed in the town, as to the work of the most active and useful of the abbots of Evesham. The goodness of the architecture, notwithstanding some minor details to the contrary, would lead some at first sight to think that the tower was many years older than it was; but this might be accounted for by the supposition that it was built during the early part of Abbot Lichfield's career, which would be about the year 1514. He felt that he need not say anything to stimulate the people of the town to take care of the tower. It seemed to be an extremely rare specimen of the class of buildings to which it belonged. As it was almost the only real and nearly perfect remainder of the abbey, every inhabitant of the borough should feel an interest in it, and endeavour to develope its beauties and prevent its being hidden from sight. The walls on either side of it were detrimental to its appearance, and he could only express a strong hope that they would be removed, as well as every other obstruction which marred the beauty of this unique and noble specimen of architecture, so that its grand proportions might be displayed to their fullest extent.

The Rev. A. H. W. Ingram said he was glad to find that the documentary testimony he had produced was confirmed by the architectural evidence of the tower itself. To add to the proof already adduced, he found that Tindall, the historian of Evesham, gave the Latin inscription on the tomb of Abbot Lichfield, which translated, was as follows:—"Pray for the soul of the priest in whose time the new tower of Evesham was built."

Sir Stafford Carey said that in Dingley's as well as in Grosse's "Antiquities" there were views of the Evesham bell-tower as a specimen of architecture of great interest, and in both cases the tower was represented as being without the obstructions of the walls now on either side of it.

Mr. Blashill said it was due to Mr. Walcott to state that he argued that the words "new tower," quoted by Mr. Ingram, referred to the central tower in the Abbey, and not to the bell-tower. The question had, however, been decided upon the architecture of the tower itself, and not upon the rather vague documentary evidence.

Mr. Ingram said it was palpable that the words could not apply to the central tower, because Talbot, the antiquary of Elizabeth's time, referred to Lichfield's structure as the tower "which is left untouched"; whereas the central tower had then been demolished. He was confident that had Mr. Walcott himself been present he must have acknowledged himself satisfied by such convincing proof as had been brought forward to upset his contention.

The Vicar of Evesham said that they were perfectly alive to the importance of preserving the bell-tower. When they had finished All Saints' Church, they would have this tower thoroughly restored. But in the meantime a new roof would be placed upon it to make it water-tight.

The Abbey of Evesham.

Several papers were of course forthcoming on this subject. At one of the meetings,—

The Rev. N. G. Batt, M.A., vicar of Norton, read a very able paper on "The Abbey of Evesham, illustrated by the Lives of a Triad of its Abbots." The following is a summary:—The little town of Evesham is chiefly recommended to archæologists as the seat of a great abbey which, though scanty remains of it are left, flourished for more than 800 years, from its foundation in 701 to the dissolution in the sixteenth century. Its abbots were amongst the most powerful and wealthy barons in the midland counties. They were fifty in number. We shall consider the lives of three,—Egwin, Egelwin, and Lichfield,—who represent the beginning, the highest prosperity, and the fall of the institution. The story of the foundation of Evesham Abbey resembles the account of the apparition of the Blessed Virgin at Lourdes, in our own time. She was first seen of the swineherd Eoves, and then of his master, the Bishop of the Wiccians, Egwin, whom she charged to build a church in that place, then deserted and overgrown with thickets, but doubtless recommended by its agreeable situation in the fertile valley of the Avon, where the abbeys of Pershore and Tewkesbury were afterwards founded. The legend of St. Egwin's penance, when he locked his feet together, and threw into the river Avon the key, which a fish of the Tiber miraculously restored to him, was suggested by the gospel story of St. Peter finding a piece of money in a fish's mouth. Similar tales are related of other saints. Egwin, both in life and death, was very anxious to secure his abbey from spoliation, and to maintain its privileges. Thus, when an old countryman attempted to swear away land from the monastery, his beard suddenly dropped off in the presence of the saint's relics. The smiths of Alcester were punished for interrupting the saint's sermon, by an anathema which long prevented any one from carrying on the trade in that town. Norton Church is dedicated after St. Egwin, and his likeness is to be seen on the ancient lectern there, which once belonged to Evesham Abbey. He appears to have been a man of real piety, and of great energy and influence among his contemporaries, and may be regarded as the originator of civilisation and improvement in the Vale of Evesham. Egelwin, the last Saxon abbot, presided over the abbey at the time of the Norman Conquest, and was famous for his prudence and knowledge of law. He continued to be in favour with Edward the Confessor, Harold, and William the Conqueror, who did not deprive him of the office, like most of the other Saxon abbots and bishops, but gave him charge of the Abbey of Winchcomb in addition to his own, and advanced him to the government of several counties. So that it is recorded that no Saxon nobleman was so much trusted by William. Egelwin made a good use of his great wealth and authority, and fed a multitude of poor starving people, who had escaped from the devastation of the northern counties by the Conqueror. His kindness to the orphan children is particularly commended. He added to the possessions of the abbey and successfully defended them against usurping Normans. His successor, the first French abbot, mistrusting the genuineness of the abbey relics, which had not saved the English from defeat, submitted them to the ordeal of fire, out of which they emerged triumphant. Egelwin was the ablest of the abbots, and his mixed character has been too hardly dealt with by modern historians on account of his supposed want of patriotism. Clement Lichfield was the last real abbot of Evesham, and to his time belong the bell-tower, the chantry chapels in the parish churches, grammar school, the chief remaining buildings once connected with the abbey. It is wonderful how he was able to do so much, and embellish the choir of the abbey church also, since he was subjected to continual and heavy exactions by the King and Wolsey.

Buckland.

The excursion on the third day included Buckland, and the party on arrival proceeded at once to the church, where they were met by Mr. J. O. Halliwell-Phillips, who, as lord of the manor, welcomed the visitors, with the majority of whom he was well acquainted, through previous archæological sympathies. Here Mr. J. Robinson, architect, read a short paper on the history of Buckland, and described the church, which is a building of the thirteenth century, as regards the earlier portion, but it is also made up of specimens of many architectural periods, having been restored and repaired at different periods, and having thus become a rather remarkable and interesting illustration of various styles of architecture. In the chancel or east window are some beautiful specimens of stained glass, of a date antecedent to that of the church. This glass is supposed to have been brought from Hailes Abbey. It was evidently never intended for the window in which it now does service. Proceeding onwards, the party next inspected the Grange, at Broadway, formerly belonging to the Abbey of Pershore, and until recently used as the parish workhouse. Shortly after two o'clock, the party having all mustered at the Lygon Arms, Broadway, a *déjeûner* was served, after which,

Mr. Isaac Averill read a paper, prepared by Mr. J. O. Halliwell-Phillips, on "The History of Broadway." The main subject of the paper was a disquisition on the enormous labour required in order to do justice to a history of either town or village, and the immense number of records to be examined, the references to be made, and the time occupied in such investigation. The writer concluded with some curious particulars, showing that Shakspeare was quite familiar with Broadway and its neighbourhood, which might well have been the case, considering their proximity to Stratford-upon-Avon.

The old church at Broadway, disused for religious worship since the new church was built nearer the centre of the village, is principally remarkable for its monuments of the Phillipps and Russell families. The present pulpit appears to have been made out of the rood or chancel screen. The nave of this church is of Early English character, but the aisles and chancel are of the Late Perpendicular of the Tudor age. Some amusement was created by an ancient-looking inscription, which at the first glance appeared like a sepulchral inscription on a Roman columbarium, but which when read was as follows:—

"ASTHOWARTSOWASI, ASIAMSOWILTTHOWBE."

On Thursday Hailes Abbey, Sudeley, and Winchcombe were visited. Concerning the former,

Hailes Abbey,

Mr. Loftus Brock read a careful paper, and at the close conducted the party round the ruins, pointing out their character and history with much perspicacity and eloquence, and closing his remarks by expressing the hope that the noble owner of the property would cause the ruins to be excavated, and their foundations laid bare, as he felt certain that much valuable information would, by these means, be obtained. Mr. Brock's paper, and his remarks were greeted with well-deserved applause. The excursionists next proceeded to Sudeley Castle, the noble residence of Mr. J. Coucher Dent, where they were hospitably received and entertained by Mrs. Dent (Mr. Dent being unhappily detained on the Continent by ill-health) at a luncheon prepared for them under a tent erected for the occasion, in the quadrangle of the Castle. After luncheon, Mr. Cripps, on behalf of Mrs. Dent, bade the Association welcome, and after proposing the health of the Queen, which was most heartily responded to, and that of the Association, which was acknowledged by Mr. Morgan, F.S.A., the treasurer, Mr. Roberts proposed the health of Mr. and Mrs. Dent, in appropriate terms, in the course of which he remarked, amid loud applause, that Mr. Dent had in preparation, and intended shortly to publish, the history of Sudeley Castle, than which he could not conceive any more interesting addition to our historical literature. Next the historical, archæological, and art treasures contained in this noble pile, and forming the fit garniture of such a casket, were examined, but the number of the visitors, and the time at their disposal, permitted only a most cursory glance at the numberless objects of interest and beauty here assembled. To be appreciated the beauties and treasures of Sudeley must be seen, and this sight, be it recorded to the great credit of Mr. and Mrs. Dent, is never denied to those who seek it. After this inspection, Mr. Edward Roberts read an interesting paper on the history and archæology of the castle. Mr. Roberts dwelt at some length upon the architectural details of the castle, calling particular attention to the oriel window now in ruins, and which overlooked a pleasaunce, the site of which now formed the beautiful flower-garden which had been laid out with rare taste upon the lines of the old pleasaunce. He also detailed the history of the occupants of the castle from the creation of Ralph, Lord Sudeley, in the 26th of Henry VI., mentioning its grant to the Duke of Gloucester, afterwards Richard III., and the death and burial of Catherine Parr within its walls, and as an incident of note that her funeral sermon was preached by Miles Coverdale.

Friday was a day marked out for considerable work, including as it did Pershore, Deerhurst, and Tewkesbury. The party was divided, some going by water and others by carriages. The latter, in consequence of the refusal of the drivers to go so far as was needed, did not see

Deerhurst,

and, under the circumstances, we cannot do better than adopt the account of it given in the *Standard*, by a well-known local antiquary:—Not a student of Gothic architecture in England is unfamiliar with the existence of Deerhurst church. Its double angular windows, which look from the tower into the nave of the church, have been engraved many times as specimens of the architecture of the Saxon period of English history, and there are many who are inclined to give to Deerhurst an antiquity as a Christian Church, which is denied to Canterbury and Winchester. It is remembered that when Augustine came on his mission from Pope Gregory, and under the auspices of Queen Bertha and her husband founded the great monastic pile at Canterbury, he came northward, and found himself confronted by an organisation of bishops who belonged to the Christian Church, which had survived not only the persecutions of Diocletian, but the fire and sword of Pict and Saxon. It is said that Augustine met the British bishops in some portion of the Wiccian territory—some say in the neighbourhood of the rude stone circle which still exists at Rollrich, and others at an oak tree in the neighbourhood of Hentlebury, the present seat of the Bishop of Worcester. Whichever place saw the conference of the Christians of the older Church with the missionary of the Pope, it was not far from this old church of Deerhurst, whose tower still raises its head in the rich alluvial vale near the confluence of the Avon and the Severn, which, in far-off times, must have been secure from the invasion of strangers by the swamps which surrounded it. The church bears unmistakable evidence of belonging to the period which elapsed between the departure of the Romans and the advent of the Norman style of architecture. Its windows are rudely formed with slabs of stone, some placed anglewise so as to form a rude pointed arch, others form rectangular openings by the same means. The more elaborate specimens of masonry consist of the now-blocked-up chancel

arch, a door or two at the western end formed in the manner known to architects as long and short work. The rude masonry of the exterior shows many examples of "herring-bone" work. There cannot be a doubt that the church is of pre-Norman date, and, though subjected to many alterations and enlargements, yet presents the essential features of the original. The walls of the nave have been pierced with arches which date from the thirteenth century, whose curious caps are excellent models for the students of this era of architecture. The dip font is clearly Norman, and is placed upon what appears to be an older one of the same pattern of tracery. The tower was a point of great and singular interest. It is divided from north to south and from east to west. Passing up a rude newel staircase, the visitor speedily found himself in a small apartment, containing the double angle-headed window so well known to architects. On either side were circular-headed aumbries. It was pointed out that the fluting of the mullions of the windows was similar to the ornamentation of the chimney-pieces at Polesworth Abbey left unfinished when the dissolution took place—a remarkable instance of Roman influence on the earliest and latest work in our Christian edifices. One gentleman suggested that the room was the cell of an anchorite, but Mr. Edward Roberts, to a subsequent party, thought it was a place for refugees who sought the right of sanctuary here. This is the more probable as the small Priory of Deerhurst was not unknown in connexion with the shelter of persecuted persons in Mediæval times. This idea receives confirmation from the existence of two singular corbels on the west side of the tower, the appearance and form of which suggested that they were hoists employed to convey food and necessaries to the inhabitants of the tower. In the farm-house adjoining, which has been made out of the conventual buildings, there is a rectangular window of large size, filled with flamboyant tracery, and in the garden the corbels which supported the wooden roof of the cloisters on the south side.

It was quite late in the day when the majority of the party reached time-honoured Tewkesbury, and many had not time to do more than to glance at the Abbey Church. But Tewkesbury is full of interest. Some of its old houses are as picturesque as any in Bristol, Chester, or Shrewsbury, and well repaid inspection. The church of the old Abbey, now undergoing restoration, was the great centre of attraction. Its massive tower rears its head as it did in the days of Fitzhamons, its founders, at the latter part of the eleventh and beginning of the twelfth century. The immense circular arch at the west end, now filled in with a Perpendicular window, is a marked feature in the exterior of the church. The interior alone gives the visitor an idea of the grandeur of the old Norman buildings. Like Oxford and Gloucester, Tewkesbury still retains the massive circular piers of the aisles. These immense piers rise 30 ft. from the floor of the nave.

To Mr. Blashill's paper on Tewkesbury we will return. We must now hasten on to say, without notice of wonderful Alcester, that on Saturday, the modern mansion of Ragley was thrown open to all holders of Congress tickets and invited guests of the noble president, the Marquis of Hertford. At a little after two o'clock not fewer than 200 visitors thronged the saloon, galleries, and terraces of Ragley, where they were received by the marquis and marchioness, the Earl and Countess of Yarmouth, and a distinguished party of guests. A sumptuous repast was served in two of the largest rooms of the mansion, and after the toast of "The Queen," the Marquis gave, in the library, an interesting and graphic account of the treasures of the house; its association with Jeremy Taylor, with Horace Walpole, and other distinguished visitors, together with the history of the Conway and Throckmorton papers now in the national collection. The greatest archæological attraction was a fibula and other ornaments found with a few bones, strap-buckle, and daggers on the estate about thirty-eight years ago. The fibula is one of the finest known, and was pronounced Celtic in design and workmanship.

As Mr. George Wright's "cheerful horn," which had been most valuable during the whole week, gathered the party together for the last return to Evesham, there was but one feeling amongst them as regarded the evenly and universally extended kindness of the President, host and the Marchioness of Hertford.

The local *Journal* (in which good reports of the proceedings appear) says, after congratulating the town and neighbourhood, and the members of the Association, upon the success and pleasure attending the Evesham Congress,—"Amongst its results are a feeling of increased respect for the important work of the Association, and a quickened interest in the archæology and history of our town and neighbourhood." That is just the result which the founders of these congresses anticipated and desired.

SANITARY AND INDUSTRIAL RESULTS OF THE SESSION.

BRITISH MONEY ABROAD.

If the object and purpose of a Session of Parliament be the enactment of the greatest possible number of brand-new laws, the Session of 1875 presents a falling off, as compared with some of its predecessors.

But if the most useful functions of a body that is very far too large and indiscriminate in its composition to legislate, except in a very rude and empirical manner, be the elucidation of important questions by public discussion, and the enlightenment of that public opinion which is the actual source of legislative action at the present time, our reflections on the past Session may take another tone. There has been an intolerable amount of sack, indeed, to the halfpenny worth of bread. But it is not so sure that the sack of discussion has not been of more national utility than the bread of positive enactments. As a general rule, the nation has been taught how impossible it is to give due consideration to all the details affected by a great measure, if forced and hurried through Parliament. If this lesson had been truly learned, even had it been the sole result of the debates of 1875, they might have proved truly useful.

The Royal Message on the 13th of August takes credit for the passing of some fourteen measures through Parliament. Of these, three relate to the improvement of the law, as regards the transfer of land in England, entail in Scotland, and the procedure of the Civil Courts. Two are financial, bearing on the diminution of public debt, and the regulation of loans for public works. One concerns a local detail of ecclesiastical organisation, but has great interest in an architectural point of view, as it converts the most ancient abbey, and largest ecclesiastical building, in England, into a cathedral; which we may hope to see restored to something like its original beauty. Two are mercantile; one being the stop-gap and temporary measure for regulating merchant shipping, as to which so strong a feeling was awakened in the country; and the other relating to the registration of trade marks. The remaining six enactments have more direct reference to the industrial and the sanitary condition of the country, which has thus received a large proportion of the attention of Parliament.

Of these six new laws, the most considerable, in point of length, is simply consolidation. It has garnered up the large library of sanitary enactments into a single book. In so doing, as we pointed out when the Bill was under discussion, it has simplified the subject, made it more easy of comprehension, and more fit for well-considered improvement in detail. A positive gain, if not all that could have been desired, has been secured by this Bill. In connexion with the same subject, the main principle which must underlie any wise and adequate sanitary legislation on a large scale,—the demarcation of watershed districts,—has for the first time been acknowledged by the administration, in a clause of the postponed Bill for preservation of Rivers, which was unhappily swamped, in the absence of any such enthusiastic advocate as has taken up the cause of unseaworthy ships.

The Artisans' Dwellings Bill we discussed when introduced.

In the new laws relating to Friendly Societies, to master and servant trade offences, to the Law of Conspiracy, and to the conditions of agricultural holdings, there has been a total absence of incisive or violent change. Whether any real advance has been secured by either or by all of these measures remains to be seen. At all events, much discussion has been allowed. The views of different parties have been brought into publicity, and the difficulties attendant on all organic changes have received more attention than has been the case for some years. It is probable that discontent will be to some extent alleviated; but certainly we have had ample proof that it is not within the power of Parliament to offer that *panacea* which certain persons consider is to be attained by legislation.

More important, if rightly grasped, than any actual legislation of the session, has been the tremendous *exposé* of the unblushing robberies committed under the name of Foreign Loans. We feel a double interest in this matter. First, because the constant drain of the accumulating wealth of the industrial and trading classes of this country, which has been effected by the foreign "borrower," has prevented that outlay of the capital upon the soil of our own island which would have insured a tenfold return. Secondly, we may be permitted to add, because we have always endeavoured, so far as our voice was heard and our influence could reach, to warn the English public against that disposition of their available savings of which the "Loans" of the South American States form the most complete and full-blown example.

Intimately connected with this question of Foreign Loans, and of the importance which the press gives to the debates and reports of Parliament and Parliamentary Committees by publishing the warning thus addressed to the unwary, is the subject of that Roman Improvement Scheme, as to which we addressed a warning to our readers in our number of the 20th of March last. A more recent number very fully justifies that warning. We wish our readers to feel assured that we speak with, at least, as much positive and direct experience of the procedures of those who invite English capital to flow abroad as does the Committee on Foreign Loans. Colossal as may be the roguery in some instances which they have pilloried, it differs only in degree, not in kind, from the ordinary routine. Foreigners who ask for English money mean to keep it, if they can get it. That is a safe general rule. What they may be induced to pay for the use of it, depends mainly on the chance they have of borrowing more, by dint of keeping up a decent character. When no more capital can be "borrowed" the amount of interest paid on that already obtained rapidly tends to a vanishing point. That lesson is so old, so repeated, so unvaried, that it is a marvel that men are always ready to burn their fingers in the same way.

It should be borne in mind that, apart from the question of absolute necessity, the laws, the sentiments, and the habits of business of all foreign nations differ materially from our own. A man of integrity and honour, apt to the discharge of business in this country, even if he be familiar with the language of any part of the continent, is as incompetent to carry on business abroad, until he has served a long apprenticeship to the particular occupation and locality in question, as a fine boy of eighteen, fresh from Eton, would be to manage a City bank. We can see, in a moment, where an English engineer is likely to have been misled, from the very straightfordwardness of his nature, and his expectation of a similar conduct in those whose names he had learned to respect. Thus we find the receipt of instructions "in the presence of an English gentleman" mentioned; the idea being that the evidence of a third party would be decisive. Nothing can be further from the fact in Italy. Personal evidence, as a rule, can always be thus obtained in any sense that is wished. If a disputant rely on the probity and high character of a single witness, he will be discountenanced by the preponderance in *number* of the utterly unexpected witnesses who will appear in Court to contradict him. Thus the case must really depend on the "instructions in writing" alone. If these are clear, precise, legal, and formally bind General Garibaldi to pay the professional costs of the English engineer, the latter may have a hold on that patriot under Italian law, and possibly, in some ten or a dozen years, may obtain judgment, if his debtor be then alive. If there is the least screw loose in them, he had better put up with his present loss and disappointment, and set both down to the cost of professional education.

But even if a positive liability were formally contracted by Garibaldi towards Mr. Wilkinson by a written instrument, it would remain to be seen how far, if at all, this was condoned or modified by the demand of the 12th of April, and the concurrence of Mr. Wilkinson in presenting this demand to the Minister of Public Works. This demand, however "favourably received," seems never to have been formally accepted. The Italian view, no doubt, would be that Mr. Wilkinson had incurred his own risk, in a sort of quasi-partnership with the Italian would-be *concessionnaires*, and that the whole thing fell to the ground together. This upshot, unless every

nail were clinched as soon as it was driven by an able Italian counsel, would certainly have occurred on the tempting though imaginary offer of a quarter of a million of francs.

All the subsequent steps, down to the characteristically just and considerate promise of a transfer to a company which should make a large outlay in the vague hope of a concession, are so exactly according to the regular routine in such matters, that all we can suggest, as at present advised, is that Mr. Wilkinson should publish the fullest details of the whole affair. If he, like other men in his profession whom we could name, is to be nailed to the door of the barn, let us at least hope that the operation may be effective, by way of scarecrow, to keep other English engineers and capitalists from following the same path,—a path like that to the lions' den,—in which all the footsteps point in the same direction.

Whether we look to the English or the Italian Parliament, to sanitary and river protection Acts, or to concessions for reclamations, ports, and harbours, we see everywhere the same indications. We are looking in the wrong direction for the employment of our money. We are in such a hurry to become rich, that we remain, or worse, become, poor. Our own island offers a fairer field for the remunerative outlay of capital than is to be found, as a rule, in any other part of the world. To drain, irrigate, plant, cultivate, build, at home, promises a sound, certain, and ample return,—wisdom directing the application. If we venture our sovereigns abroad, it will probably make little difference, a few years hence, whether it is to make a ship canal in America or a port in the vicinity of the Pontine Marshes.

THE FURNITURE RENAISSANCE IN FRANCE.

For several years, a revolution in public taste,—to which, in Paris, the above rather pompous title is given,—has been taking place among the wealthier classes in France, against the flimsy, showy, tricky style of furniture so long characteristic of that country. But it is only of late that the reaction has reached a high and wide development. Most persons are familiar with the ordinary components in the arrangements, for comfort and decoration, of a Parisian drawing-room; a profusion of gilt and mirrors; of richly-coloured damask or velvet; of elegant tables, chairs, and trifles, very choice of aspect from the upholsterer's point of view, by no means cheap, and better calculated to look than to wear well. At several successive Exhibitions, including that of the present season, attempts have been made to introduce a better fashion, and, without abandoning splendour, to combine it with solidity. It was as a protest, indeed, against the modern or sham method, that a class of purchasers arose who refused admission into their houses, whenever possible, to nineteenth-century fabrications, and who ransacked the remotest quarters for specimens of the older and more substantial manufactures. There was, perhaps, a touch of pedantry added to the dislike of that which is popularly called the gim-crack order of things, with a little admixture, possibly, of affectation; yet certain it is that, in France especially, anything having about it the odour of an ancient château was competed for by greedy buyers in the great bric-a-brac market,—if that term may be extended so far. The wonderful progress in the art and mystery of cabinet-making, in the manipulation of wood, in the production of thin veneer, in staining and imitation of every kind, resulting in work which would not withstand the slightest shock, or the least change of temperature from wet to dry, or the contrary, was carried in fact too far, and French furniture became nothing less than a byword for meretriciousness and, comparatively speaking, worthlessness. Of course, as in all such cases, the new idea speedily grew into exaggeration, and equally, of course, it called forth a supply as spurious as are thousands of relics in Italy, and thousands of antiquities in Egypt. The genuine treasures of past centuries were naturally soon exhausted; and when all had been bought that could be repaired, patched, vamped, and strengthened by invisible braces, the shops were gradually filled with another description of bargains for the amateur; objects looking older than the oldest that had really once belonged to the family castles of Provence or Tourraine; huge chests and cabinets drilled with artificial worm-holes, covered with iron clamps of Mediæval appearance, requiring a good deal of labour to rub off the rust of time; and chimneypieces browned by the wood-smoke of ages ago. The fraud may not have been a particularly heinous one; but it was felt by the higher class of manufacturers that it might be practicable to supersede the "red-and-gilt" style, as it was contemptuously called, by one which, while it restored the old characteristics of French furniture, should not pretend to be based upon any except new materials. This gave rise to the experiment of working "in the solid." Not that it had not been practised, to a considerable extent, previously, in France as elsewhere; but that it had left the general fashion untouched, though, as we have said, a taste for the antique had spread so far that, according to a Parisian satirist, even the grandest salon was regarded as incomplete without, at least, one stool, with twisted legs, that dated from the Middle Ages. Artists, no less than mechanics, were required to effect the innovation, and they were found before long, for the genius of the French workman is exceedingly plastic. At starting, on all hands, marvellous mistakes were made, and the promoters of the Furniture Renaissance fell into the error of imagining that nothing could be an improvement on the gew-gaw mode unless it were sternly Mediæval, while, on the other hand, an eclecticism sprang up founded upon equally ridiculous principles. There is one well-known example of this in a large and brilliant villa, thoroughly Italian in its architecture, on the outskirts of the capital. The proprietor, who designed the building, externally and internally, prescribed, also, the way in which it should be furnished. The ante-chamber, the dining and smoking rooms, and the library,—all spacious apartments,—were assigned to the age of Louis XIII.; the drawing-room, in white and gold, to that of Louis XIV.; the bedroom, profuse in carving and gilding, to that, again, of Louis XIII., or the commencement of Louis XV.; and the boudoir to that of Louis XVI., with three other chambers, one Chinese, another Persian, and a third purely fantastic. As a sarcasm upon this, a neighbour boldly ordered his abode to be furnished, from roof to basement, in "the style of Napoleon III." It does not follow, however, that a design was tasteful because it was in vogue under any "Louis." A notorious dance of our own time derived its name from an arm-chair, with hideous sprawling legs, called a Can-can.

But these were not the most important points which related to the design and construction of furniture, and led to the education of a large class of Parisian artisans. A few enterprising firms took the lead, collecting models, drawings, manuals, and so forth, chiefly directed against the use of veneer, and to the revival of a purer taste. It is interesting to visit a workshop where, on a large scale, the process of manufacturing from the solid wood is carried on. Every incident in the history of the tree, from the felling in the forest, is illustrated here, or in the adjoining yards; the stripping off the bark, the rough-hewing of the trunk, the sawing into planks or squares, the drying and seasoning. These last are, it is needless to say, highly important details, the French system differing somewhat, however, from the English. Their technical phrase is "mummifying" the timber. Occasionally they employ heat and the smoke of burnt sawdust, when the necessary result is obtained in about two months; but the cases in which this method is practised are special: the approved rule is for wood to be converted into furniture, to be stacked, with ventilating intervals, in the open air, for fifteen years, which, however, keeps stagnant an amount of capital so large that few manufacturers can afford it. He would be a fortunate inventor, in France, who should teach its great furniture firms how to hasten the process without, as they express it, cooking the wood, and decomposing its fibre. For it is this that renders the best qualities of make so costly. Indeed, not many houses can allow their money to lie thus at rest. It is like the planting of trees, and waiting for their growth. In one yard, a little beyond the old barriers, may be seen stack upon stack, belonging to a single firm, of oak, walnut, pear, beech, elm, alder, maple, linden, and willow, worth from 800*l.* to 1,000*l.* each, continually dwindling, and as continually replenished. Each log, or plank, as its turn comes, is piled in a covered shed, with palisaded sides, through which a current of air constantly flows, having been previously, however trimmed by the axe, to get rid of any decayed parts, and, in company with the commoner sorts, are mahogany, amaranth, sandal, and cedar wood. Here they remain until sent for. A customer has come with an order: he selects, from the books of design, one which suits him; sometimes it is the architect himself who undertakes this responsibility. A plan on a small scale is sketched, and submitted; if approved, one of the full size is drawn, and given to the joiner, who goes to the yard with an order for the wood he requires. Then, through sheets of cardboard, each marked in pencil as a part of the pattern, and stretched on the planks, panels, or blocks, fine holes are pierced, indicating exactly where the saw should pass, and much ingenuity is shown in economising material. It is unnecessary to follow out the process in detail. The saw does its work, and the several pieces are taken to the joiner, who finishes them up to a certain point, whether by hand or by machinery; the latter, in some of the Parisian factories, being surprisingly effective and simple. But a minute description of it would go beyond our purpose. Every fragment is now ready, so far as the joiner is, at present, concerned with it, and the whole is passed over to the chief, or foreman, of the carvers, or "sculptors," as the Parisians prefer to call themselves. There are, in some establishments, more than 200 of these employed; but they do not all work in the shop. Many take their task home, to complete, single-handed, or with the aid of assistants. They come to "the house," take the parts assigned to them, with the original designs, and bring them back when finished. Still, the interior of a large workshop presents a scene sufficiently animated, and even grotesque. You see an enormous block, which a "sculptor" is converting, by means of a chisel, into a trophy of figures and foliage. It is not far advanced, but is evidently intended to be a chimney-piece, on the most massive scale. That which we particularly noticed was a "commission" for the painter, Gerome. The wood is treated precisely as though it were marble, and behind it, a little raised, is the model, in plaster, from which the artist works. The whole is in a single, solid piece. The walls are covered with similar models, in plaster or terra-cotta, of the human figure, animals, flowers, and ornaments; while, hanging from the roof-beams are masks, bas-reliefs, and squares of cardboard enriched with elaborate drawings. Against a partition dividing the joiners from the carvers, lean statues of nymphs, goddesses, and heroes, often of full size, and the half of an oaken Venus swings like a figure-head from between two beams. Two long tables run between the partition and the windows, covered with tools and pieces of wood, of various dimensions and in various stages of manipulation, which are passed from hand to hand as they progress. Thus, one may carve a face, and pass it on to have an animal, or a garland, or some ornament combined with it, and, of course, a greater nicety is required when the sculpture is to remain in its simplicity, without being painted or gilded; but one principle is invariable: if a panel requires, so to speak, a foundation and a cornice, all three must be wrought from the same piece of wood; there must be no nailing, no glueing, no veneering. The carvings finished, they are returned to the joiners, who put them together experimentally, with glue; for this, as we have said, is forbidden, as well as pegs, in the completed work, which ought to fit into itself, everywhere. That, at any rate, is the theory of this Parisian Renaissance. They next "try on," to use a tailor's term, the ironwork, manufactured often by the same firm, — locks, hinges, screws, and castors. The piece of furniture is then finally built up, and lowered into another shop, to receive the last touches for beautifying and preserving it. And when this has been done, the contrast is evident, to the most unpractised eye, between, for example, the deep, glossy, smooth-surfaced black, dense as ebony, of some furniture displayed at recent Exhibitions, and that of another quality which has been painted black and then varnished; but the process required by the former, calling in the services of powdered charcoal, logwood, dissolved in oil, sulphate of iron and gall-nut, linseed, and essence of turpentine, and endless brushings with dog's grass, and rubbings with flannel, is, of course an expensive one, though the result is equivalent; a surface indelibly tinted, and a substance unassailable by insects. These, at all events, are the pretensions put forward in the *ateliers* of the new fashions in French furniture. Oak and walnut, it need hardly be said, are variously treated, while other woods, finely veined by Nature, receive only the treatment necessary for

their preservation. Not, however, to be betrayed into lingering among these minutiæ, interesting though they are, attention may be pointed to the fact how extensively this comparatively new style is to be met with in the better shops, and, therefore, in the better houses, of Paris; whether in the shape of chests (the French always had an almost Venetian fondness for them, and put them everywhere possible), tables, chairs, bedsteads, panellings, wainscot, doors, and cornices, to the dire defeat of gilding, which peels off, of that ghastly white paint, which turns to a ghastlier yellow, and that poor pretence of richness which deceives the eye in French hotels and English taverns. And with this, a gradual change is manifesting itself in another,—and it will, perhaps, be thought a more questionable respect,—the more general introduction of carpets, though, in what has been said, no idea existed of instituting any comparison between English and French furniture, or French and English furniture custom, if the phrase be permitted. The object was to point out a distinct and remarkable growth of taste, in Paris especially, and a wide, though far from general, repudiation of that style, which, a few years since, was almost universal, and for which, on account of its very frivolity, and its shallow ostentation, the French claimed the palm of elegance,—a style made up of cheap velvet, cheap gilt, and bad cabinet-work. But it may be worth repeating, that a very superior order of art-mechanics has been created by this movement of fashion and taste in France. Formerly, they would, or a large proportion of them, have been sought for from abroad, from Italy, or from the Low Countries. As it is, they have sprung almost exclusively from the industrial ranks of France herself. Nor are their numbers inconsiderable. One Parisian establishment alone employs upwards of six hundred, in the several degrees, at wages varying from 5f. to 25f., or 1*l.* a day; and to indicate the rapid advance of this Renaissance (the term in its special application here is not our own), it is necessary to say no more than that the manufacturers complain of a pressure upon their resources which interferes with the development of artistic progress in the design and fabrication of furniture.

FRENCH CRITICISM ON THE ART OF *PUNCH*.

In noticing one or two recent numbers of the serial entitled *L'Art*, we mentioned that one of them (No. 30) contained an article on *Punch*, under the head of "*La Caricature Anglaise contemporaine*." It is interesting, in more ways than one, to know how the designs of our leading satirical paper strike a foreign art-critic. What M. Champier, the author of the article in question, first remarks on is the good-humour of the caricature in *Punch*, as compared with most foreign work of the same class, and with English caricature of a past generation. In the latter, everything that could give grotesque and almost brutal force to the caricature was unsparingly employed. The artists of the present day, among whom are specially mentioned Messrs. Keene, Sambourne, and Du Maurier, follow what the critic thinks a special tendency in England to emphasise purity of form at the expense of *gaieté*." M. du Maurier, above all, "in his scenes of child-life, of such pure and graceful drawing, seems bent on withdrawing his art from the freedom of caricature to enclose it within the stricter limits of realistic representation, insomuch as his sketches are not so much satires as charming *genre* pictures." Looking to one or two of the artists who have passed away, M. Champier compares Cruikshank with Leech, and observes that the latter carried on the talent of the former with another quality added, viz., the power of beauty, which had hardly before his time been found co-existent with that of satire or caricature. In the early illustrations to Dickens by "Phiz" (which cognomen, with true French exactitude in such matters, is given as *Phy*), "feminine beauty is as rare as in the works of Hogarth" (is it so rare in these latter?); whereas Leech's young women have genuine charm.

M. Du Maurier, however, occupies the bulk of the article and the illustrations, as in fact we might expect. A few facts are recapitulated as to the life of "Georges Louis Palmella Busson Du Maurier," who is a native of Paris and was educated as a mining engineer, but gave up his profession for the study of drawing, and became in 1857 a pupil of Gleyre, and after some travels in Belgium and Germany for further study, settled (fortunately for us) in England. He ought to be considered, says the French critic, "as the most authorised representative of the contemporary caricature of manners in England. Nothing can surpass the charm of some of his infantine scenes. We recognise the influence of the celebrated painter from whom he received lessons, and one comprehends the precision of his efforts in learning what minute care the artist bestows upon them. In a letter which we received from him lately, he says, 'I design my figures with as much care, and look out for models as conscientiously, as if I were going to make an oil painting.'" This we can readily credit, though in regard to the infantine scenes we may say that Leech has done things which M. Du Maurier has never equalled; and the same in regard to ladies, who have far more variety of style and character in Leech's hands than the type, elegant and graceful as it is, to which M. Du Maurier almost entirely confines himself. The succeeding remark of M. Champier is worth attention:—

"We cannot but say, however, that this is not caricature. The artist will object, perhaps, that he is condemned to a good deal of reserve by the very journal to which he is a contributor, and which, having the *entrée* of all the family circles, must be such as can be turned over without danger by young girls. We should reply that the field of caricature is vast, and that it cannot be traversed by an artist (whatever his talent) who confines himself to representing small and rebellious children, ladies of a refined beauty, with low foreheads, necks like a tower, long and delicate arms, garments of subtle shades which surround their persons with glancing reflections, and in the languid grace of which one discovers, as an English critic lately observed, a taste of the old Chinese and Japanese affectation."

We should have said the *new* Japanese affectation; but the criticism is a true one; and though we should be very sorry to see our friend *Punch* parting with the unblemished purity of his manners, and rendering himself a questionable guest in any English family, the fact of the intellectual limit imposed on caricature by the influences named can hardly be doubted. In England, in fact, literature and art are fenced in at all points by certain canons of respectability and propriety. The result is an undoubted gain to the majority, but it involves some loss to a rather important minority, including the artists themselves. We are quite ready, however, to regard the moral gain as more than balancing the artistic loss; and may point out that French critics of greater calibre (M. Taine, for example) have referred to the purity and good manners of English caricature as a notable point of superiority over that of their own country.

The designs by Du Maurier selected for republication in the French serial include a shop scene, a schoolroom scene (the definition of "duty"), and two *scènes de salon*, one being the celebrated episode of "The Misses Bilderbogey," which name again the French writer, with characteristic error, metamorphoses into "Rilderbock," thereby, of course, losing the significance of the semi-German compound, in its indication of the æsthetic character of the young ladies. One of Mr. Sambourne's most masterly costume caricatures, the half-length of a girl with a "coiffure à la Marlborough," forms another illustration, but only gives one side of that artist's remarkable and admirable talent.

The article, in spite of its general title, is specially directed to the caricature of *manners*, not to political satire, which we presume is the reason why the name of Tenniel is passed over; the omission, except on such a supposition, would, of course, be simply absurd.

A HITCH IN THE LAMBETH NEW INFIRMARY CONTRACT.

The contract for the new infirmary at Lambeth is causing some difficulties and misunderstanding. We stated in last week's *Builder* that pending inquiries into the financial position of Messrs. Tarrant & Son, whose tender was the lowest, the Guardians had postponed their decision as to the acceptance of any particular tender. At the meeting of the Board last week the special committee appointed to investigate the capability of Messrs. Tarrant & Son to carry out their tender, recommended that the tender should be accepted; and on Mr. Tarrant being called in he stated that he had read the conditions of the contract. Subsequently, in answer to a question, he said he was not prepared to execute the work in eighteen months, as stipulated in the articles of contract, which he had not before had an opportunity of reading. It was then represented to him that if the building were not finished within that period the penalties would be rigorously enforced, whereupon Mr. Tarrant stated that in that case he would withdraw his tender, at the same time stating that he could complete the building in two years. After he had left the board-room, a discussion took place on the subject, when the chairman observed that eighteen months was a very short time for the erection of such a building. On the other hand, Mr. Taylor, one of the members, stated that the tenders had been invited upon the understanding that the work should be executed within eighteen months. If the time were extended every one of the firms who tendered ought to be apprised of the fact, inasmuch as if some of them were aware that a longer time would be allowed they might be able to reduce the amounts of their tenders. Having determined upon the question of time they ought not now to reconsider it. Mr. Higgs said he had been given to understand that not one of the firms who tendered was aware of the time in which the works were required to be finished, but Mr. Fowler, the architect, said that was not so. It was then decided to inquire into the capability of Mr. Taylor, who had sent in the next lowest tender, to execute the work. It may be stated that there is only a difference of 400*l.* in the tenders of Mr. Tarrant and Mr. Taylor, the former being 53,200*l.*, whilst that of the latter is 53,600*l.*

SALE OF FAIRLAWN COTTAGE, KEW-GREEN.

Fairlawn, a well-known historical residence at Kew, was sold by auction last week, at the Mart, by Messrs. Fuller & Fuller. Fairlawn, with the grounds attached to it, immediately adjoins the residence of H.R.H. the Duchess of Cambridge, on the south-east side, the Tichborne and Doughty estates being on the north-west. The conditions included a statement to the effect that one portion of the property was vested in the vendor "under an assignment from the trustees of the will of the late Roger Charles Tichborne, esq., deceased, for the residue of a term of 1,000 years," and the condition added that "the purchaser shall assume that the said Roger Charles Tichborne died on or about the 26th of April, 1852, and that the said term passed by his will, as part of the Doughty estates, thereby devised and bequeathed for sale, and that the same is free from any of the incumbrances and powers of charging in the said will mentioned." The property was put up at 800*l.*, and after some spirited bidding was sold for 1,330*l.*

ENLARGEMENT OF THE HASTINGS INFIRMARY.

The Governors of the East Sussex, Hastings, and St. Leonard's Infirmary having decided upon a material enlargement of the building, or erecting a new one, resolved upon consulting Captain Galton as to the capability of the present structure for enlargement, or the erection of a new building on a new site. After inspecting the building and other sites, Captain Galton has just reported to the Governors, in which report he speaks favourably of the present site on the sea-shore, well sheltered from the north, and with a nearly due south aspect. He had inspected two other suggested sites, but they were open to objection from their exposure to northern winds, and also cut off by houses in front from the view of the sea, which, he states, together with its sheltered position, is the striking characteristic of the present site.

After suggesting several structural alterations in the internal arrangements of the existing building, with the view of improving its sanitary condition, the introduction of ventilating fire-places, and the cutting off of the hospital drains from the main town drains by efficient traps, he recommends the addition of another story to the building, and the erection of a new wing, to provide two large additional wards, and a small ward, which together would give seventy beds, as against thirty-two, which is the present amount of accommodation. The expense of the new wing cannot, he states, be assumed at less

than 3,800*l*. The erection of the extra story would not be less than 3,000*l*., whilst the minor alterations suggested would amount to between 300*l*. and 400*l*., including the reconstruction of the dead-house, and the re-arrangement of the basement, which would be necessary to provide the required kitchen accommodation. The total estimated expense of the enlargement and alterations would thus be about 7,200*l*.

HOUSES IN THE PHILIPPINE ISLANDS.

The inhabitants of the Philippine Group are, as a rule, bad masons, and but indifferent carpenters. The houses of the better class are fairly constructed, but the huts of the masses are much the same as those of the Malays of Borneo and other parts of the Indian Archipelago. They have plenty of timber, enormous forests being still untouched in most of the islands, and an abundance of cheap Coolie labour to render the cost of transport comparatively light. Apart from the bamboo, one of the most precious productions of the country, from its adaptability to the wants of the Indians, they use to a large extent molave, a wood of extraordinary durability against damp and wet, even when enclosed in mud and masonry. It is very hard, of a short, close grain, of a pale yellow colour, and susceptible of a high polish. It is much prized for piles, and for columns or piers, forming supports to houses. They have a beautiful hard yellow wood, spotted with large blotches of black, which makes very handsome furniture. It is called camagou, some specimens of which resemble the walnut; and another kind also well adapted for furniture, panelling, &c.,—a red wood, with close grain and visible pores. Some varieties have been confounded with mahogany, from the appearance of the veins.

But the bamboo is the material used by the great masses of the people, and with it they construct scaffolding, houses, bridges, cables, tools, and weapons. In the pueblos or villages which form the suburbs of Manilla, the native dwelling is raised from the ground on wooden supports, and is reached by a ladder. Bamboos form the scaffolding, floors, and principal woodwork, the walls and roof being clothed with the leaves of the Nipa palm. A mat, a table, a rude chair or two, some pots and crockery, pictures of saints, and some trifling utensils, comprise the domestic belongings. Almost every house has a garden, with its bamboos, plaintains, and cocoa-nut trees, and some with a greater variety of fruit. Each pueblo has its *gallera*, or amphitheatre, for cock-fights; for this is the favourite amusement, nay, the delight and business, of the male population. The galleras are large buildings constructed of palm-trunks, bamboo, and nipa-leaves, consisting of a hall lighted from windows in the roof. In the centre is a stage raised about 5 ft. high, surrounded by bamboo galleries for the convenience of spectators. From these places the Government draws a considerable revenue, such is the craze for cock-fighting among the Philippinos. Indeed, it is carried so far, that while a man's children are crawling about his house and garden, and the women hard at work, he will most probably be seen lounging about with his game cock under his arm, or meditating on the prowess of the *gallo* in attendance on the *gallinas*.

The better class of houses in Manilla are substantially built of stone, brick, and tiles. They are usually rectangular, having a court in the centre, round which are shops, warehouses, stables, and other offices, the families occupying the first floor. Towards the street there is a corridor, which communicates with the various apartments, and generally a gallery in the interior looking into the court. The rooms have all sliding windows or frames, fitted with *concha* or plates of semi-transparent oysters, which admit an imperfect light, but are impervious to the sunbeams. A large cistern in the court holds the water which is conveyed from the roofs in the rainy season, and the platform of the cistern is generally covered with jars of flowering plants or fruits. The first and only floor is built on piles, as the fear of earthquakes prevents the erection of elevated houses. The roof is ordinarily of red tiles.

Though there is some variety in the houses of the natives in the interior, according to their opulence, they preserve a common character, having bamboo floors, nipa roofs, and wooden pillars to support them. Either supported by a post, or projecting from a window of the house, is usually to be seen a little bamboo frame, containing a supply of food or fruit from the Indian garden which invariably surrounds the dwelling. Any passing traveller may help himself, paying nothing if he be poor, but otherwise leaving such compensation as he may deem proper. This surely is a very pleasant custom.

Although naturally an indolent people, the Philippinos might be brought to a more energetic condition were the Government to perform no more than its own natural functions. As it is, it occupies the anomalous position of merchant and ruler. The commercial system is, in consequence, confined within official channels, and the great agricultural resources of the islands are but partially being developed. The tobacco leaf is one of the principal productions in these regions. The provisions for its culture are very arbitrary; in some provinces the people are permitted, and in others prohibited, to engage in its cultivation. The leaf must be furnished to the Government at rates which are anything but remunerative to the producer, and finally it is manufactured and sold by the authorities. When it is said that the peasant is often compelled to borrow money at exorbitant rates to enable him to support his family until such time as he becomes reimbursed for the value of the tobacco supplied by him to the Government, it must be admitted that the condition of the growers is by no means enviable. Nothing, however, in the shape of land-tax presses on the shoulders of the inhabitants. Permission is only granted to the peasant to hold land during the time he chooses to cultivate it. Should he neglect cultivation for the space of two years, it is liable to be forfeited to the Government,—a regulation which has the effect of preventing large tracts of country from falling uselessly into few hands.

The price of land in the vicinity of Manilla and in some of the more fertile parts of Bulacàn is valued at 140 dollars the acre. In Pangasinan its average value is about 30 dollars; in Negros it varies from 2 dollars to 16 dollars the acre; but where population is scanty, as in parts of New Ecsija, it is to be purchased at an almost nominal rate.

The price of skilled labour varies from 37½ cents to 62½ cents a day for carpenters and masons. Coolie labour costs 4 dollars per month and maintenance. Shipwrights working in the river receive 50 cents a day; if working in the bay 1 dollar.

Various stuffs, called pina, sinamais, and nipis are manufactured in the islands of Panay and Luzon. Pina is made from the fibre of the pineapple tree, and when worked with silk is a very elegant commodity. But many of the native manufactures being anything but durable, and, moreover, very expensive, they are becoming rapidly superseded by European goods. Hemp cordage is wrought in the provinces of Albay, Camarines, and Manilla; and great dexterity is displayed in the making of mats, baskets, hats, cigar-cases, &c.

NEW LIBERAL CLUB IN WARRINGTON.

The necessities of an increasing number of members of the Liberal Club having for some time past outgrown the original provision made, several of the leading men connected with the party secured the residence of Mr. Rylands in Bewsey-street. Messrs. Pierpoint, Hughes, & Pierpoint, were entrusted with the preparation of plans, and the contract for carrying out the work was given to Messrs. Ostle & Taylor, builders, Warrington. A new billiard-room has been erected, 69 ft. by 35 ft., in which five billiard-tables will be fitted up. A platform, 4 ft. wide and 1 ft. above the level of the floor, runs round the room, and will afford ample accommodation. The room is lighted by a continuous skylight on each side of roof, whilst the artificial lighting will be provided for by means of a gas sunlight over each table, and attached to the ventilators in the roof. Underneath the floor are three compartments. The centre part will form a heating chamber, and the warm air from the hot-water pipes will be diffused throughout the billiard-room by means of perforated grids, one being placed under each billiard-table. The two side chambers will be supplied with cold air, and by means of movable ventilators in the floor the temperature of the room can be regulated with nicety. The walls are stuccoed and finished so as to prevent the appearance of stonework. An adjoining room, 24 ft. by 20 ft., will also be fitted up as a billiard-room, and will be provided, as well as the larger room, with lavatories and closets.

The reading-room, which adjoins the entrance-hall, is 24 ft. by 18 ft. It was used as a drawing-room by the late occupant, and some historical pictures are painted on the walls. A refreshment-room, 24 ft. by 11 ft., also occupies the ground floor, immediately adjoining the kitchen. The principal room on the first story will be 27 ft. by 20 ft., and it is intended to be used as a conversation-room.

The structural alterations and additions, and the fitting up of the establishment, will cost something like 1,500*l*.

FRENCH ASSOCIATION FOR THE ADVANCEMENT OF THE SCIENCES.

This Association, the plan of which is a close imitation of the British Association for Science, has been holding its congress at *Nantes*, and a number of valuable papers have been read. In the programme of the first day appears the intimation, "Punch will be offered to the members of the congress at the Hôtel de Ville," a precedent for which does not exist in the British arrangements. We take no exception, however, to it, being ourselves of a rejoicing turn of mind, and well disposed towards all friendly junketings. The punch was given in the evening in the *garden* of the Hôtel-de-Ville, which was brilliantly illuminated with lamps and Chinese lanterns, and the statues were brought into relief by coloured fires. The punch (hot) was followed by a speech from the mayor, and then came champagne.

The theatre was decorated tastily for the president's address, and brilliantly attended.

On Saturday, the 21st, one of our countrymen, Dr. Phené, delivered an address on the habits of the cave-men of Western Europe, in the Anthropological Section of the Association.

The chief point of the lecture was to show, from a similarity of *crania* and works, that the customs of the people of the neolithic age were the same both among the Dolicho-Cephali, or long-skulled people, and the Brachy-Cephali, or broad-skulled people.

The discoveries of Dr. Broca, Dr. Prunières, and others, were quoted in the presence of those *savants*, and compared with cave explorations made in France and Spain by the lecturer.

Admiral Ommanney, in the discussion on the paper, gave some detailed particulars of the discoveries in the Genista caves at Gibraltar, at some of the explorations in which he had been present with Professor Busk.

Dr. Jackson, F.R.A.S., read a paper on "Falling Stars," and exhibited the rare maps, published by the British Association on Astral Science.

THE NEW RESERVOIR FOR THE LIVERPOOL WATERWORKS, AT RIVINGTON.

Although the Corporation of Liverpool have resolved upon the construction of new waterwoaks at Bleasdale, about fifty miles from the town, in accordance with the report and designs of Mr. Bateman, C.E., they are at the same time not failing to increase the sources of supply at their existing works at Rivington, which are situated about twenty miles from the borough, and a large new reservoir in the neighbourhood, 65 acres in extent, which has been in course of construction for the last seven years, has just been completed. This new source of supply, which is called the Yarrow Reservoir, is situated not far from the present Rivington Reservoirs, and forms an almost natural basin of great capacity. It was designed to store the supplies from the converging branches of the river Yarrow, which have hitherto chiefly run to waste. The engineering character of the works have been of a heavy and formidable nature. At the lower end an embankment was necessary, and in the construction of this part of the work there have been much difficulty and a great expense incurred. In the first instance, a depth of about 150 ft. had to be trenched, in order to find a good foundation. The height of the embankment itself is 110 ft., which will give some idea of the stupendous nature of the works. The greatest depth of the reservoir is 93 ft., and its estimated capacity of supply 1,000,000 gallons per diem, or 7,000,000 gallons per week. Its construction has involved an expenditure of 200,000*l*.

It was originally suggested by Mr. Duncan, C.E., the late water engineer to the Corporation, and has been carried out by Mr. Jackson, C.E., with Mr. Robert Martin as resident engineer.

CONVENTION OF THE AMERICAN INSTITUTE OF ARCHITECTS.

The annual address at the Eighth Annual Convention of the American Institute of Architects was read by Mr. H. A. Sims. In the course of it he said,—

Before a desire for good art can be expected among an essentially utilitarian people, some enlightenment must take place, some enthusiasm must be awakened. With either of these incentives a desire for good and real architecture is sure to follow. There is an old Florentine proverb, "That you might as well physic the dead as attempt to instruct the old." The hope for more appreciation of our art in the future, I take it, is rather to be looked for from such means as have been adopted at Cornell University in this country, and at Oxford and Cambridge Universities in England—engrafting on to schemes of general education for the young a certain amount of art teaching. Very little is to be hoped for from instructing those who are old, set in their opinions, and established in a total disregard of art matters.

The journal which we propose shortly to commence will be our first real step towards addressing the public. Will it be a success? The question can only be answered by us architects. I make no doubt, if our serial is conducted in the proper spirit, and contributed to by the best architects throughout the continent (I say this advisedly, for this Institute is intended to embrace the architects of the continent, and the journal issued under its auspices should be supported by all)—if it is so supported and so conducted it will be a success. It must effect much good in disseminating orthodox ideas on architecture. The full and proper appreciation on this continent of our art, or, indeed, of either of the other fine arts, is as yet very far off.

The majority of us are of Anglo-Saxon lineage, and our race has always been more characterised by an appreciation of the practical, of the utilitarian, and of the useful, than of the beautiful. A railway, a bridge, or a steam-engine, is much more admired and appreciated by the generality of our race, than the grandest cathedral would be. It is so in Great Britain, and it is so here. As a race we have no natural and instinctive love for the beautiful. I think it was Goethe who made a remark to the effect that we should foster a care for the beautiful, for the useful would take care of itself. Goethe addressed this idea to his own countrymen. It might have been applicable to them, but I am very sure that it would have been more applicable to our people of the Anglo-Saxon race than to Germans.

I once knew a New England millwright living in a small city in Canada. He had amassed a considerable fortune, and was having a large house erected for himself on one of the principal streets. His neighbours remonstrated with him upon the unsightly appearance of the building. His reply was:—"That he intended to live inside the house, not outside; the inside would suit him very well, and he did not care a button who liked the outside." I feel sure that man may be accepted as a fair average of our countrymen as they are found outside the larger cities, and of all of them who are uninfluenced by fashion or the desire for advancement in social position.

The first idea with the practical American is, that his building shall be well and substantially constructed; secondly, that it shall be conveniently arranged for his purposes. The appearance,—or, in other words, the architecture,—he cares nothing about. The high moral doctrine is enunciated by Mr. Garbett, the English architectural writer, that a man has no right to shut out a portion of the light of heaven from his fellow-men, or spoil a landscape by erecting a building, unless he does all in his power to compensate for that deprivation by rendering the building sightly, if not beautiful.

I fear that Mr. Garbett's idea would hardly find favour with the majority of our countrymen, and I doubt if very many of his own countrymen would be willing to adopt his views, although no doubt both Englishmen and Americans will admit the beauty of the idea; but will say it is not one for practical business men, but rather a notion for young ladies to expatiate upon. Yet even though the great Anglo-Saxon race, as a race, does not sufficiently appreciate the beautiful, as was done by several of the races of ancient times, and by the Latin races of our own day; yet I think the fact will be conceded that the Anglo-Saxon race and the English language are the race and the language of the commerce of our day. Yet the fact must be admitted that architecture in all past ages has always marked the progress of civilisation. The rude hut or tent of the savage marks plainly the barbarity of his life. The ugly yet ingeniously constructed buildings of the Chinese and other Mongolian races mark the step in advance of the savage, as their structures are better than his hut.

In all past ages, the style of art exhibited in the architecture of a nation, or a race, was, to a great extent, an index of the culture, civilisation, and enlightenment attained. Greece produced her finest buildings when she was in the meridian of her greatness. Europe, in the thirteenth and fourteenth centuries, when the best mediæval work was produced, not only held the power of the world, but all its learning. Mr. Taine says,—"The more we contemplate architectural works, the more do we find them adapted to express the prevailing spirit of an epoch."

In a new country like ours, which must be opened and rendered habitable before it is embellished, our brethren the engineers have rather shorn us of some of our importance, and are doing what architects were called upon to do, before the division took place in our profession. Giotto, Bramante, Brunelleschi, Michelangelo, Palladio, and all other great architects of the Italian Renaissance, executed engineering as well as architectural works. They erected bridges and fortifications, as well as palaces, churches, and theatres, more purely in our line. Architects, therefore, as those who add grace and proportion to utilitarian structures, as well as engineers, have played and are playing a very important part in the history of civilisation. It is they who erect the milestones in the history of the world's advancement. I esteem that the part of the architect is of a higher order than that of our brethren the engineers.

The public does not appreciate architects. Our own people and the British people are nations of shop-keepers, and as a race, we appreciate only what gives back in money a fair return for the money invested. Our people, as a people, really esteem architecture only so far as it pays. This is a hard condition to exact from art,—a condition in which it cannot be expected to flourish in at all a healthy way. But I am sure that we can see the dawn of a brighter day, a day in which art will be loved and appreciated for its own sake only.

Various reports were read. In the *Report of the New York Chapter* it was said,—"Without entering into the detail of the difficulties encountered by the Committee on Examinations in the way of securing anything towards its advanced aims,—difficulties arising from the low state of public education, as regards the æsthetical, scientific, and sanitarian requirements of good building art, and from the conflicts of political and municipal conditions,—nowhere more potent or more destructive than in our locality,—it may be sufficient to say here that, with the help of the Building Department of the City, and of the Board of Fire Underwriters, an important step in the right direction has been gained. At the very close of the last session of the State Legislature, an amendment to the Building Law was passed, subject to the Governor's signature, which was afterwards added, providing for the formation of a Board of Examiners, consisting of the Chief of the Building Department, a member of the Committee on Examinations of this Chapter, one of the ex-Presidents of the New York Board of Fire Underwriters, and two members of the Mechanics' Exchange, one a master-mason and the other a master-carpenter. The power entrusted to this Board is the discretionary one to modify or vary the different provisions of the Building Act to meet the requirements of special cases, where the same do not conflict with the public welfare,—a power formerly vested in the late Chief of the Building Department alone, and which, as will readily be appreciated by all who have been brought in contact with the routine of the building trade, might with uncontrolled facility be wielded to an enormous extent in the interest of the individual and against that of the public."

The *Boston Chapter* showed, in their report, that, by interference, they had obtained satisfactory conditions for a competition in that city.

The *Albany Chapter* gave a report from their Committee on Education. The committee express regret that students will not remain long enough in the College of Architecture of the Cornell University at Ithaca. Speaking of the ordinary course pursued in offices, the report says:—"The office-student is too apt to liken his case to theirs, and to go along, month after month, trusting that his six or eight hours a day of drawing and tracing will presently have brought him where he needs to be. He does not consider that what is for his companions a permanent condition of life, which they can afford to take quietly, is for him a temporary relation, full of opportunies, but opportunities the full fruit of which is only to be gathered by the diligent worker, avaricious of work. If instead of knocking off work when the office closes for the day, and devoting his leisure time and thought to other things, the office-student would consider that his own day's work, the work that will tell for himself, is just beginning, and sedulously give his evenings to the study and examination of just the things that he is occupied about by day, he will find that a year of office-life will profit him more than three years will profit another. The resources of the office are naturally open to him; that they shall be, should be a part of his agreement on entering it. By making himself thoroughly familiar with what they contain, and throwing in the light to be obtained from the books and from the practical papers constantly appearing in the professional journals, he could inform his mind and ripen his judgment to an extent that would soon surprise both himself and his employer. And these studies would immediately make themselves felt during the day. In the first place, his rapidly increasing powers would put him along rapidly in the path of advancement, and more responsible work would be entrusted to his care. In fact, here, as heretofore, the more he knew the more he would be able to learn. Secondly, he would be in a position to profit to the utmost by the experience and knowledge of the mechanics with whom he was brought in contact."

A Report of the *Committee on Professional Practice*, read on the second day, agreed as to the desirability of adhering to the system of charging by commission. The report ended thus,—

"It is, of course, essential to the maintenance of any custom that it should be adhered to, and that the practice of setting aside should not itself grow into a recognised custom. Usage, like confidence, is a plant of slow growth, and what it has taken many generations to build up may be thoughtlessly destroyed in one. But the reasons which have led to its establishment are always the best arguments in its favour. If the reasonableness and practical convenience of a custom do not cause it to be honoured by observance, we can hardly ask men to cherish it merely for the sake of keeping it alive. These customs are, in fact, the only protection that either we or our clients possess against intolerable nuisances of bargaining and chaffering, a plague from which the very shopkeepers have had sufficient self-respect and firmness to rid themselves, and which is utterly destructive of proper professional relations. To call attention to the basis of reason and convenience on which they rest, and to show that they subserve the best interests both of the architect and of his client—for in the long run their interests are the same, and are bound up in the good of the work—is, as it has seemed to us, the best service that this committee, or the Institute, whose servants we are, can perform. It is thus, and not by an arbitrary legislation, conceived in a hostile and aggressive spirit, that such uniformity of practice as may prove possible is to be brought about. This association is not a trade-union, selfishly combining against the public. It is an enlightened and public-spirited body, seeking by co operation and mutual consultation to advance the public interests committed to our professional charge."

Mr. Sims, as Secretary for Foreign Correspondence, read a report. In it he said,—I have been favoured by a Swedish architect, at present resident in this country, with certain facts connected with the architecture and building of Northern Europe, which I think may not be uninteresting to you. He informs me that few or no buildings were erected thirty years ago excepting of bricks, which were stuccoed and elaborately worked out in details imitating the finest Italian marble, cut with the greatest artistic ability. The bad quality of the bricks and the rigorous climate prescribed these conditions. As a further precaution, the bricks were very often painted with oil-colours. In St. Petersburg this latter is a law, and every house-owner is obliged to repaint his house every second year. This system of facing a building gives the city and the numerous country-seats a gay and luxurious

appearance, but at the expense of durability. Buildings are now frequently constructed of freestone, and also of chalkstone. Some of the former and all the latter are covered with oil-paint. Although granite abounds in the northern countries, buildings erected of that material are unknown. Basements are often built of this material, and foundations always are. The habit of suburban residence is very general among the wealthier classes of Northern Europe. Persons inhabiting the cities occupy their villas only during a few months of the year. But, like the English gentry, many spend the greater part of the year at their country seats. Between the two classes the country is sprinkled over with country seats, castles, and palaces; many of them making great pretensions to architectural merit. Many of these establishments have fine parts and much elegance. Many have gardens, vineries, and greenhouses. In late years, there have been often added winter gardens in immediate connexion with the reception-rooms. Formerly all the houses for the peasantry and poorer classes were constructed of solid timber, from 7 in. to 10 in. in thickness, plastered on the inside, and covered externally with boards. The timber, however, is so rapidly disappearing that the system of construction has to a great extent been superseded by the ordinary frame construction in use on this continent. In the southern part of Sweden the terra-cotta construction of Germany and Denmark has been tried, but it is thought that the system will not prove permanent or lasting, owing to the united effects of the salt air and extreme cold. The city dwelling-houses are generally upon the apartment system, of large size, with very heavy brick and external party walls. The municipal regulations as to these, the size of open yards, and the precautions against fire are very strictly enforced. These apartment-houses are from four to six stories in height. The ground-floor is usually devoted to shops, and very seldom to living-rooms, the first-floor being the choice flat for residence. It is very rare to find the basements used as living-rooms."

The annual dinner of the Institute took place at Delmonico's, and, after dinner, addresses were made by several guests and members.

THE BUILDING TRADE IN MAINE, UNITED STATES.

It is surprising what a difference of opinion exists among British consuls respecting the nature and value of their functions, and one is almost tempted to ask what sort of instructions they receive when they obtain their posts, and to regret that England does not train her sucking diplomatists in the consular school as some Continental powers do. But we choose to bestow our consulates in a peculiar way, to restrict our consuls (with very rare exceptions) to an inferior branch of the public representative service, and, as a natural consequence, we have gathered the most heterogeneous collection of commercial foreign officers in the world, and invest gentlemen of all grades of capacity with the honours of representing this country in foreign ports, of hoisting the national flag and of receiving salutes on stated occasions. A time may come when we shall "reconstruct" the consular department, but until it arrives we must be contented to accept any queer document as a consular report, and must not be surprised if a cool representative at an important port summarises the commercial news of the year in a single line stating how many ships were entered and cleared, while a zealous servant at a minor town fancies we shall be interested by cuttings from the local papers. Those who have studied the consular reports of the past year can judge of the justice of our criticism generally. At present our object is merely to call attention to and to summarise one of the best and most interesting trade reports of the year, which has been written by Mr. Murray, our consul at Maine, who has spared no pains to supply useful information to the trading classes of this country, and who has often, when official data were wanting, taken great trouble to render his picture accurate.

Taking only those parts of the story which suit such a journal as this, we find that there is abundance of timber in Maine, if the estimate be correct, that a billion and a half feet of pine are standing while the supplies of hemlock and spruce are "practically inexhaustible," while hackmatack, yellow birch, rock and bird's-eye maple are very plentiful. The year 1874 was unfavourable to the lumber business, for the building trade was depressed, and consequently manufactured lumber was slowly sold. Some of the biggest saw-mills therefore closed operations early after filling their wharfs as well as all the orders they could get. The deficit in sawn wood for the year is said to fall little short of ten million feet from the average. The deal trade was good, some twenty-eight million feet having been shipped to Liverpool during the season, which was four times the amount sent over during the previous year.

The total saw-mills in the State in 1873 was 1,109; the capital invested in them, 7,629,442 dols.; steam power, 3,403 horses; water power, 41,383 horse; long lumber manufactured, 667,420,000 ft.; short lumber, 72,405,000 ft.; value of production including shooks, staves, and headings, 9,672,235 dols.; hands employed, 7,844; wages, 2,851,000 dols. It is calculated that the total amount of sawn lumber on hand in the spring of 1873 was about 70,000,000 ft., while 592,000,000 logs were ready for sawing. The amount of capital invested in the trade is very large, and is being increased although the traffic is diminishing. It is said that they are being cut down so fast that the supply of timber will be exhausted in from five to ten years; but the inhabitants of the State live in security because the same prophecy has been made for years, yet Maine has gone on yielding an average yearly product of some six hundred or seven hundred millions of feet. Maine has the largest proportion in area of any of the lumbering States, and hopeful people assert that although the destruction of woodland has been in progress for over half a century, with new growth the forest area is so great and so prolific that it cannot be stripped of all its mercantable lumber for at least another fifty years.

The clays of the State furnish materials for an immense number of bricks, which are exported to a considerable extent. The number of brickfields is set down as ninety-three, with a total capital of 317,185 dols., giving employment to 917 hands, and manufacturing 71,549,000 bricks annually. The market for Maine bricks is in the State of Massachusetts and the southern ports. Limestone is found in fourteen counties out of sixteen, and is extensively manufactured into quick lime. The stone furnishes 50 per cent. of pure lime, and burning it constitutes one of the most important industries in the State, giving employment to a multitude of workmen, and furnishing freight for a large number of coasting-vessels. Maine lime even reaches this country, and the trade is rapidly increasing. The official returns from twenty-five establishments show an invested capital of over a million dollars, seventy-nine kilns, and nearly two million dollars' worth of the manufactured product made. It is stated that there is granite enough in Maine to build all the cities of the world, and certainly the granite formation is an extensive one, traversing large portions of the State. Blocks of immense size have been split out, some weighing more than 100 tons each. The granite quarried is of good quality, of fine grain, and good colour. Most of the quarries are on the coast. Some of them employ over a thousand men, some of whom receive 4 dols. a day. Not less than three million dollars are annually expended for the wages of workmen engaged in this industry. The stone is all hewn into proper shape in Maine, cut to fit its place in the intended building, then boxed and hooped, and shipped to its destination. Immense quantities of paving-stones are also shipped to the south. Marble is found and worked in various parts of the State, but it is generally considered better adapted for building than for ornamental purposes. A very good article of verd-antique marble has been found at Deer Isle, the annual production being about 26,500 dols. worth. Roofing slate is found in Maine in immense quantities, and of a superior character in colour, grain, and cleavage. The principal belt extends more than eighty miles. Instances exist of slabs being slit into very large squares, and manufactured into tables, black-boards, &c. The slate industry is rapidly growing in importance. The average annual earnings of blacksmiths are 670 dols.; those of brickmakers, 225 dols.; those of quarrymen, 292 dols.; and those of sawyers, 730 dols. Water-power is much more in use than steam-power, and represents the force of 75,000 horses. It is said that there are 3,100 water-powers in the State. A local statistician has calculated that the industries of Maine engage 2,656,200 horse-power, equivalent to the working energy of over 34,000,000 men labouring without intermission from year's end to year's end. Tidal power is also employed, and can be utilised at small expense, the mean height of the tide being nearly 12 ft.

IMPROVED PLASTERING FOR BRICK WALLS.

Some years ago the "Verein zur Beförderung des Gewerbefleiss in Preussen" (Society for the Promotion of Prussian Industry) offered a prize for the best composition of plaster for brick walls. The conditions imposed at the time were,—

1. That the composition should not be affected by the weather, and present an even, smooth surface when applied, becoming neither cracked nor loose by exposure to sun or frost.

2. That the composition should admit of a uniform durable colour being applied to it, the colour to penetrate either through the whole mass, or at least to a depth of $\frac{1}{16}$ in. from the surface.

3. It was further stipulated that, although the application of this composition might somewhat exceed the cost of ordinary painted plaster, still its use should be cheaper than "stucco lustro."

The silver medal of the forementioned society, supplemented by a money prize of 75*l.*, was awarded to Ambroselli, a mason of New Barnim (near Wriezen), after his plaster-composition had been proffered to the society, and stood a practical test of several years' exposure to the weather. It is, moreover, stated that prior to this crucial experiment, it had already been applied to the Abel Villa, near Potsdam, and had served for plastering over most of the architectural decorations of this villa.

A German contemporary has been lately favoured with some particulars of this Ambroselli-plastering method from the inventor himself, and, since it appears to be well received on the Continent, we propose giving the following notice of this plaster. Before proceeding with its application, it may, however, be well to remark that no new principles or materials are advocated in this composition; but, on the other hand, its application demands great exactness of workmanship, and a careful selection of the ingredients. Moreover, the laying-on process demands that the wall-surface on which it is applied be built of hard, well-burnt bricks, free of marl, and previously thoroughly dried. The materials used are lime and sand, which must be entirely freed of all impurities by special cleansing; and, as the following description will show, three different kinds of mortar are prepared from three qualities of sand.

With these preliminary remarks, we may now proceed to describe one of its most difficult applications, namely, in the imitation of sandstone dressings. For this purpose, the brickwork itself should bear as much resemblance as possible to the profile desired, so that the laying on may be conducted in as uniform a manner as can be obtained. The wall-surface being priorily well damped with water is now ready to receive the first plaster-coating. This is composed of one-third of well-slacked lime (which should be slacked at least a fortnight previous to using it), and of two-thirds of the sharpest sand. After this mass has been thoroughly mixed together, Portland cement is added in the proportion of one-fourth the volume, and the first mortar-composition, after having been thus prepared and well mixed up, may be applied in a wet state to the surface of the wall as even as possible. To prevent air-bubbles or cracks occurring, the different layers should not be applied too rapid, and time should be always allowed between the layings on, in order that the mortar may somewhat set.

The desired profile having been nearly attained with mortar No. 1, a finer mass (No. 2) may now be laid on. The latter is prepared by adding to two parts of lime and two parts of fine sand, 0·12 parts of Portland cement, and so much of the prepared liquid paint as is necessary to produce the desired tint when stirred together with mass No. 2. Two layings on with this second mortar will suffice in ordinary work to bring the desired profile to the form required, and it need only be remarked with regard to this composition that this mass should also be kept wet, and so laid on.

For very fine work, however, a third coating is used, which is made of one part of the finest sand, one part of fine-sieved lime, 0·05 parts of fine-sieved cement, with the addition

of the requisite colouring matter to ensure the desired tint when dry. This addendum must, of course, be determined by experiments made beforehand, which will give the necessary mixing proportion required. The most complete intermixing of these ingredients is absolutely necessary, and with two coatings of this mass No. 3, an experienced hand will finish the dressings in the most elegant manner.

Having thus explained the laying on of this Ambrocelli's plaster, it will be well to remember that it is advisable to divide the laying on surfaces into so many days' work, since each portion begun must be finished the same day, for reason that the composition cannot be touched up after a certain lapse of time.

With regard to stencilling, very clean effects may be obtained by using good stencil-plates, made of hard wood and fastened with iron, but the greatest elegance is said to be only attainable by using polished steel plates. By means of these and the fore-mentioned description, dressings can be made able to stand all kinds of meteorological influences, besides preserving a lively appearance.

The foregoing description renders the application of this plaster to smooth surfaces self-evident. No doubt it will be more extensively used in this respect than in the other, for architectural decorations in this plaster will always be too costly for buildings of ordinary kinds, whereas, in buildings of prominent standing, imitation dressings are becoming daily more obsolete.

SCHOOL BOARD ECONOMY.

Some local bodies, *quasi*-public persons, and private ratepayers, have been much exercised of late on account of the alleged extravagant expenditure of the London School Board, who are accused of building schools where they are not needed, that fight unequally against existing denominational schools, and of erecting buildings larger and more costly than are required. These views are in curious contrast with the criticisms that the Board had to meet in the first two years of their existence. They were taunted that they talked a great deal, but did nothing; that they theorised concerning schools, but built none. The nature of the case imposed great difficulties upon the School Board. Their work was to elaborate and establish a system of elementary schools and instruction that would embrace the whole of the young people of the metropolis of the school age who were not taught at home, or in some efficient private, denominational, or other school. The Board had no data available upon which to base their scheme of schools. They had to ascertain by the best means open to them the educational wants of particular districts and localities. As yet, on the whole, they have planted their schools with sound judgment. It would have been something little less than miraculous if in the first essays of their tentative scheme they had not built some schools that filled almost at once to overflowing, and others that took some time to fill. The Board have already a good defence against the charge of extravagance; the effluxion of time is unlikely to fail to strengthen their defence, and even to extinguish the charge against them of extravagance. The Western subdivision of the Greenwich Educational Borough furnishes a notable illustration,—a pioneer illustration, it may be believed,—of this allegation.

The Board schools first opened in this subdivision, in August, 1873, were those situated in the Creek-road, and in Clifton-road. Since then Board schools have been opened in Kender-street, Hatcham, Hughes's Fields, and Duke-street, Deptford, and another is nearly complete on Blackheath-hill. We have to do herein with the Clifton-road School, which is situated on the outer edge of the populous parts of Lower New-cross. On the west of the school is a large area, occupied as market-gardens, and intersected by the Joint South-Eastern and Brighton Railways. On the east side the school premises are bounded by a large field that will be built upon eventually, but that is now in grass. Notwithstanding the comparative sparsity of the population in the immediate neighbourhood of the Clifton-road school, it was filled almost at once. The nearest Board schools, on the west and east respectively, are Kender-street, Hatcham, and Duke-street, Deptford Lower-road, both of which are full, and incapable of taking the overflow of pupils from Clifton-road, for which there is no other Board school available. The Board came to the conclusion, upon which they have acted, that the best mode of meeting the exigencies of the case was to enlarge the school to the size now reached, that some friends of education may possibly consider excessive. The school was built from the designs of Messrs. Elliott & Warren, of Westminster, and in style may be designated Domestic Gothic. The style of the original building is followed in the additions, that consist of a wing to the east front, and a retangular tower in the angle formed by the junction of the wing with the main building.

The magnitude of this suburban school may be conceived from the statement that the space now provided will accommodate 342 boys, 342 girls, and 410 infants and babies. In each of the three departments the maximum number of pupil teachers allowed has been reached long since. The teaching staff of the enlarged school will consist of a master, four assistant-masters, and six pupil teachers, in the boys' school; a mistress, four assistant-mistresses, and six pupil teachers, in the girls' school; and a mistress, three assistant-mistresses, and seven pupil teachers, in the infants' school. Total, 1,094 scholars and thirty-three teachers.

The selection of the site of the new Board school in Deptford, upon which building operations have been most recently commenced, reflects credit upon the Board, and is a good illustration of their determined purpose to gather in the children of the lowest class of the population. It is situated between Regent-street and Stanhope-street, in what may be pronounced the worst quarter in Deptford, containing a larger proportion of pariahs and gutter-children than any other. It is precisely such a situation as demands the establishment of an efficient day school, with compulsory attendance. It is also such as is left to itself by the religious denominations, such as is avoided for a school site by the National and the British and Foreign School Societies. It is true that a Sunday school has been in operation in the district for a number of years. Those who are most familiar with its operations are the most deeply convinced of its utter inadequacy as an agency to instruct and train efficiently, and especially to make amenable to discipline, the rising population of the district. The comparatively small expenditure incurred in carrying on this school is derived from eleemosynary contributions, and the teachers are volunteers that take the duty by turns,—a system very unfavourable to a teacher's influence. The experiences of some of these teachers in connexion with the Giffin-street Sunday School illustrates the character and quality of the young people that are the objects of their solicitude. One of the teachers, some time since, when the crowd at the entrance was larger and more unruly than usual, took his station at the door for the protection of such of the female teachers as had not arrived. A lot of young roughs promptly knocked off his hat, and danced upon it in their own playful manner, while another group, of larger growth, pelted him with brickbats. Part of the teacher's clothing was saturated with blood before he had finished the evening's exercises with his class. It has been, in another instance, an experience of a teacher that the youths in his class have taken the bit between their teeth, otherwise have ignored his presence, and have made the subject of conversation for the evening their experiences in Maidstone Gaol, from which they had been released during the preceding week. Notwithstanding these traits, the School Board have already proved, by a temporary school in the district in question, that this class of children, caught early, provide an efficient school-master with most hopeful material; that there is no class of children more apt, it may almost be said as apt, to receive elementary instruction. As a rule, they take the lead in the start upon a school course, but are left behind by the children of the higher classes in the pursuit of more advanced educational attainments.

Whatever may be said of other parts of London, it may not be said with truth concerning Deptford, that Board Schools are either too large or too numerous. The buildings are sightly, substantial, and commodious, but not ornate or unduly costly.

Where the Money Goes.—The *Philadelphia Public Ledger* admits that about 50 millions sterling of non-dividend-paying American railway bonds have been foisted on to the English public. We believe the actual amount to be much more than that sum.

CARDIFF AND ITS PROSPECTIVE IMPROVEMENTS.

The Cardiff Improvement Act, which was passed a short time before the prorogation of Parliament, confers important powers upon the municipality of that borough, which will henceforth be more than treble its present area, with a corresponding additional population, whilst the street and other improvements to be carried out under the provisions of the Act are of the most comprehensive character. The Act extends the municipal borough, so as to include the parishes of Roath, Canton, part of Llandaff, and a portion of Ely, an area extending four miles and a half east and west, and three miles north and south. The old borough, or what has hitherto been known as Cardiff proper, contains an area of 2,300 acres, including 423 acres covered by water and dock space, thus reducing the land built upon, or available for building purposes, to 1,877 acres. To this is now added, on the west, the district of Canton and part of Llandaff, with an area of 1,912 acres, and on the east the whole parish of Roath, with an area of 3,500 acres. The present estimated population of Cardiff is 42,500. Canton and Llandaff will add another 12,000, whilst Roath will contribute 13,000, bringing up the population of the borough as enlarged to 67,000. In Cardiff, there are 5,800 dwelling-houses in Canton, Llandaff, and Ely, 1,730; and in Roath, 2,160, making a total of 9,690 dwelling-houses in the united and enlarged borough. The present average in Cardiff is six persons in a house, whilst in Canton it is seven. The rate of increase in the number of houses built in Cardiff during the last four years has slightly exceeded the increase in population, reducing a little its density, as the census returns of 1871 give to Cardiff an average of seven persons to a house. The area of land at present built upon in Cardiff is nearly three-quarters of the whole, but of this a large portion is covered, not by dwelling-houses but by docks and works. In Canton, which has been added along with Roath, not more than one-quarter of the ground is covered, and in Roath, not more than one-fifth. Taking as a criterion the area of ground already built upon, the number of houses, and population upon it, there is on the unbuilt portion ample space for 70,000 houses, and a population of 500,000 persons, or a town eight times the size of Cardiff, Canton, and Roath combined at the present time. The population of the area now included in the municipal borough was, in 1871, 55,000. In the four years since that period it has progressed at the rate of 4 per cent. If this progressive rate of increase is maintained in the next forty years the whole area of land from east to west, and from north to south, will be covered with streets and houses, and the main thoroughfare east and west will be more than four miles long.

The Act contains special provisions as to the erection of buildings, in addition to general street and other improvements. Up to the present time the Local Board have had no supervision over the elevation of buildings, their powers being limited to the ground plan, and to the sanitary arrangements of dwelling-houses. But the new Act gives the Corporation large powers both as to the height and general elevation of buildings to be erected in future within the enlarged borough. It also contains provisions for the purchase by the Corporation of the Canton Market, together with the extinction of the market tolls hitherto collected in the Cardiff streets. It also removes the toll bars immediately outside the borough.

Several street improvements are at once to be commenced under the powers conferred by the Act. These will include the widening of main thoroughfares, and the construction of a number of enterely new streets. Several bridges crossing the canal and archways over and under the South Wales Railway are also to be widened, and in some cases to be entirely rebuilt, so as to improve and continue the thoroughfares between the old and new portions of the borough.

Fine Arts applied to Industry.—The Society of Arts has already held with success annual Exhibitions of Fine Arts applied to Industry, and in considering the whole subject of the examinations, arrangements are in contemplation for holding examinations in fine arts applied to industry. In this way the whole field of arts, manufactures, and commerce, the special province of the society, will be connected with a scheme of annual examinations in the future.

THE WEST BROMWICH PUBLIC BUILDINGS.

We briefly noticed last week the opening of the new public buildings here, which comprise a new Town Hall, a Market Hall, Free Library, and Baths. West Bromwich has grown in importance in a surprising manner, and notably within the last quarter of a century. The population of the place is now 50,000; at the beginning of the century it was only 5,000. When the question of erecting public buildings was first mooted, it met with some opposition, but this obstacle having been overcome, the erection of the public buildings was determined upon. A site was secured upon the Lodge Estate, opposite Christ Church, and on the recommendation of Mr. Ewan Christian, architect, of London, the Commissioners selected, out of about thirty competitors, the designs of Messrs. Alexander & Henman, of Stockton-on-Tees and Middlesbrough, for the Town Hall; those of Messrs. Weller & Proud, of Wolverhampton, for the Free Library and markets; and that of Mr. Pincher, of West Bromwich, for the baths. Tenders were afterwards obtained for the erection of the various buildings, and that of Messrs. Trow & Son, of Wednesbury, was accepted, the stipulated price being about 40,000*l*. The design of the Town Hall externally is of bold proportions, having at the outer corner a massive tower rising to a height of over 130 ft., the upper stage being ornamented with a continuous arcade of detached columns and trefoil arches, with a moulded cornice above. The windows generally to the basement and ground-floor have moulded stone lintels, and those of the first-floor semicircular arched heads of brick and red terra-cotta, leaving an ornamental hood mould of the latter material, of which also the string courses, the cornices, the arcading to the tower, &c., are made. Red pressed bricks are employed for the general facings, and green slates, with red tile castings, form the covering of the roofs. A flight of steps, 12 ft. in width, gives access from the principal entrance to a corridor 9 ft. wide, laid with an encaustic tile pavement, by Messrs. Maw & Co. Opening from this corridor are porter's lobby, waiting-room, surveyor's office, and offices for the sub-clerk, rate collector, inspector of nuisances, &c. The muniment-room, which is of fire-proof construction, opens out of the surveyor's office. The corridor above that on the ground-floor gives access also to the hall (but on a level with the gallery), and also to the board-room, 36 ft. by 18 ft. 6 in.; to the committee-room, 23 ft. by 18 ft. 6 in.; to the clerk's office, and two retiring-rooms. Spare offices are provided in the upper part of the tower. The main staircase is lighted by large windows filled with stained glass, supplied by Messrs. Dunn & Broughall, of West Bromwich. Two stone staircases, beside the main staircase, lead to the galleries, which are continued around three sides of the hall. The latter is in size 81 ft. by 48 ft., and is internally the main feature of the building. The ceilings, the iron-work, the walls, the doors of the hall, the pillars, &c., have been decorated (from designs by the architect) by Mr. S. Broadbank, of Stockton-on-Tees.

The Free Library and News-room lies to the left of the Town Hall and adjoins the Market Hall, and the entrance is in High-street. The reading-room is 45 ft. long by 25 ft. wide and 23 ft. high, lighted from the roof. A handsome staircase, convenient to the entrance, leads to the reference library, &c. The building has been carried out from the design and under the superintendence of Messrs. Weller & Proud, architects, of Wolverhampton, by Messrs. Trow & Sons, contractors, of Wednesbury; the heating by Messrs. R. L. Jones & Sons, of Monmore-green, Wolverhampton; and the gasfittings by Mr. Eaton, of Darlington-street, Wolverhampton.

The style of the Market Hall is Gothic, freely treated of a slightly Continental character. The hall is 90 ft. wide and 151 ft. long, having the principal entrance in the end towards High-street. The interior is divided into a central avenue, 40 ft. wide and 45 ft. high, on either side of which are arranged aisles, each 25 ft. wide, divided from the central avenue by handsome arcading, supporting by iron columns, 18 ft. apart.

The Baths occupy a large piece of ground in a pleasant part of the town between the District Hospital and the Public Buildings. The estimated cost is 3,550*l*. Each swimming-bath is 50 ft. long by 30 ft. broad. The engine-house is a firmly-built structure, surmounted by a tank, which is about 28 ft. long by 18 ft. broad, and capable of holding 20,000 gallons of water. An artesian well, 60 yards deep, is sunk for the supply of water, which is pumped up by means of a 16-horse horizontal engine into the cistern, and conveyed from thence to the various baths, which are heated by hot water through a warming apparatus from two boilers.

PREMIATED DESIGN FOR THE GERMAN PARLIAMENT HOUSE.

Some time ago the German Government invited designs from architects of all countries for their Parliament House, proposed to be built in Berlin. From a large number sent in, five designs were selected, and received premiums. One of these was the work of our distinguished countryman, Sir G. G. Scott, R.A., produced in conjunction with his son, Mr. John O. Scott, and in our present number we give a general view of the design. On another occasion we shall publish the plan of the principal floor, which will make clear the general arrangements. In response to a request from us, Sir Gilbert enables us to state, in his own words, the principles which guided him in making his design:—

In making this design it was intended to adopt or develop a style which really never appeared in the series of developments in German architecture; that is to say, a fully matured pointed style, founded on really German elements. The Germans, at the commencement of the thirteenth century, were on the high road to a noble form of Gothic architecture wholly their own, but were disturbed by the importation of French architecture. My object has been to imagine this interruption to have been *nonexistent*, and the following extract from the explanatory remarks which accompanied the design will more fully elucidate the idea:—

"The most truly national period of German architecture may be said to extend from the days of the first Otho to the end of the reign of Frederick Barbarrossa; though, for our immediate purpose we may take the buildings about the time of the last-named emperor as our type. No form of Mediæval architecture is more marked in character, and, to a German, none should be more dear, inasmuch as no style could be more truly national, or in its main characteristics more noble. As, however, it wanted one feature, the pointed arch, and as it did not yet possess many refinements and inventions, which rendered many subsequent buildings more perfect, though perhaps less characteristic, we seem to want a more advanced form of art as the ground-work of any modern revival of the style, and such more advanced development *did* commence in Germany during the early years of the thirteenth century, as we see at Limberg on the Lahn, the cathedral at Bamberg, and numberless buildings; and it is only because this natural and logical course of development was too early checked by the amalgamating process I have already alluded to, that the attempted development I am now advocating became necessary.

What, therefore, I wish here to urge is the desirableness of *continuing* and following up in our own revived works the development commenced so nobly immediately after the time of Frederick I., but too much discontinued in works in the middle and end of the thirteenth century, a development uniting in one the perfection of style which we find in such works as St. Elizabeth's Church, at Marburgh, with the more natural characteristics of Limburgh, Gelnhausen, Barnbergh, Andernaut, St. Martin's, St. Severins, &c., at Cologne, and a host of edifices which have rendered Mediæval Germany illustrious in the annals of architecture.

I beg, therefore, that my design may not be judged by archæological rules, as it has been my object, while adopting a style founded in the thirteenth century, to retain in it those especially German characteristics which may be viewed as more properly belonging to the twelfth, though nevertheless extending themselves far into the thirteenth century, and thus raising and standing by the national banner against the advancing fashion of amalgamation, which eventually effected their extinction.

The other development I have to advocate is one of an opposite character. It is the absorption into the old German style, not only of modern systems of construction, and modern appliances, so far as they are good and desirable, but of at least one feature of modern architecture, which I view as being so noble and august that no style can be considered perfect that rejects it. I refer to the cupola, as it has been developed in latter ages, a development of which the greatest examples may be said to be seen in the Cathedral of Florence, and St. Peter's, at Rome.

That the Mediæval architects of Western Europe did not reject the cupola we have innumerable proofs in Italy, in Germany, and in France. I need not, therefore, argue this point. The particular development of the cupola to which I now refer, was semi-mediæval in its origin at Florence, though its more complete realisation at Rome was in another style. This form of cupola may be defined as that which renders it an equally noble and magnificent feature when seen from within or without,—that form which Michelangelo described under the similitude of raising the Pantheon on the Temple of Peace.

For a great and dignified national structure I can conceive of no feature so appropriate or so desirable as a vast and lofty central cupola. Externally, all other forms would culminate in and do homage to this, while internally no other form could with equal majesty canopy the central hall of a palace of legislature. I have, therefore, devoted my attention (with what success I leave others to judge) to accommodating this glorious form to the details and sentiment of Old German architecture.

Of my great cupola I may say that externally and internally, it is in some degree like that of St. Peter's would be if translated into Early German style. I have so far departed from my type as to sever the internal from the external cupola, and to support the lantern which crowns the whole by a system of construction interposed between the two. The system has usually been attributed to Sir Christopher Wren, who adopted it in building the Cathedral of St. Paul in London, and has subsequently had numerous followers; but the same idea had been struck out centuries before in St. Mark's at Venice, where the very same thing had been carried out in timber, which has since become so popular, though carried out in other materials. The great advantage of the system is that it enables the designer to make the height of his cupola to suit the eye both within and without, which has always been the great difficulty to overcome."

It is reported that another competition, *confined to German architects*, is to be invited.

EFFECT OF BLOWS ON IRON.

In the course of one of the Cantor lectures on tools to which we have already referred, the Rev. Mr. Rigg said,—Besides the surface work produced by hammers, there is some hitherto mysterious and as yet uninvestigated internal work done by them. It is easy to make clear the fact, of which, however, no satisfactory explanation has yet been offered. There is on the table an ordinary magnetic needle, the ends being directed, as usual, to magnetic north and south. If, now, this common iron poker be held in the hand, and the lower end directed towards the north, but inclined about 67° below the horizontal line, the poker may be said to be in the line of the dip of the magnetic needle. Now strike the poker two or three blows upon the upper end with an ordinary engineer's hammer; it will be found that some internal change has taken place. Direct first one end of the poker and then the other to the same pole of the needle, and repulsion will be manifested in one case, and attraction in the other. Now reverse the poker, making what was the lower end the upper one; strike it as many blows as were given to it before, apply it to the magnet, and it will be found that both ends attract the balanced needle, thus showing that some change has taken place, for the poker has lost all trace of magnetic polarity. Give two or three more blows, and it will be found that the magnetic effects are the reverse of those in the first case. Such a simple experiment in the private room prepares us for results, equally unaccountable in cases where metals are subject to hammer impact, or that which is equivalent thereto; hence, for example, it is apparent why the compass needle on iron ships may be affected in consequence of the tremor to which the vessel is subjected owing to blows from waves. Nor is it a question of apparent phenomenon alone which has to be regarded in this inexplicable work of hammers. These magnetic manifestations seem to be accompanied with internal material changes which sometimes make their existence too clear by fractures as unexpected as they are dangerous.

PROTECTION FROM LIGHTNING.

Sir, — The number and intensity of the thunderstorms which have raged over this country during the season, as well as the accidents which have accompanied them, have been so far above the average that they have attracted very properly an immense amount of interest on the subject of lightning, and the means we adopt, or that are at our disposal, to protect ourselves and our buildings from the destructive effects of electrical discharge. Day after day have the daily papers been replete with details of casualties to both human life and property, for not only have trees been shattered, cattle destroyed, public buildings injured, and private houses struck, but human beings have been killed in such numbers, that, if tabulated, they would form a most disastrous list. Hence the duty of every householder to protect himself and his family.

Now, as regards human beings, we cannot, it is true, whilst out of doors, carry about with us any available means of obviating the calamity; but as regards buildings it is notorious that in no case has damage arisen where the structures had been provided with lightning-conductors, whilst on the other hand in no single case where mischief happened was there any conductor. The conditions that determine a perfect lightning-conductor are:—

That it shall expose on some prominent position of a building a metallic point, and that it shall offer from this point to the earth a path of little or no resistance to the passage of the current.

The conductor must be solid and continuous from its point to the ground, *i.e.*, there should be no joints, unless it be a well-soldered one, in the whole of its path.

Its connexion with the ground must be sound and good; in fact, in "telegraphic" language, it must make a good "earth," either by having its end coiled up or buried in a hole in moist earth and surrounded by coke, at a depth from 8 ft. to 12 ft., or by being wrapped round a gas or water main, to which it should be well soldered, or by being carried down a well or to some adjacent river or water-course. In applying conductors as a means of guarding against the destructive effects of lightning, the principle to be carried out is to bring the given building into such a state of passive electrical resistance as it would have supposing it were metallic throughout. Now, this is best accomplished by connecting together metalically, as far as possible, all large detached masses of metal in the fabric, such as roofing, metal ridges, spouting, gutters, leads, crestings, &c.,—at least, those in the line of probable discharge. These should be carefully connected to the main conductor or conductors, care being taken that all joints are thoroughly sound. Each conductor,—if there be more than one,—should make, if possible, a separate "earth," and should be connected together either above or below the ground line.

The practice adopted by some people of insulating conductors, not only complicates matters, but is quite unnecessary. The area protected by a conductor is a radius equal to the height of the conductor above ground. Thus, for moderate-sized houses, one conductor is enough.

If the finial or point project 2 ft. or 3 ft. above the chimney, it will be sufficient.

The question now arises, What is the best form of lightning-conductor? I say unhesitatingly a galvanised iron wire rope of sufficient sectional area. There is no need to go to the unnecessary expense of copper; a stout galvanised rope will carry away any discharge, and by its use cost is reduced, and a means of protection placed within the reach of all.

A finial of brass or copper, electro-gilded so as to avoid oxidation, is affixed to the highest point of the building, and the wire rope being coupled thereto is to be carried down the side of the structure, to which it should be closely fastened by stout hooks. As before observed, care must be taken to preserve continuity, as the path of the electrical discharge is always in the line of least resistance. This line may not always be the shortest lineal distance, but it is in all cases the shortest electrical distance; that is to say, that lightning picks out its shortest or easiest path to earth, selecting in its transit, with the nicest discrimination, metal cramps and fastenings, and by its expansive power shattering and destroying inferior conducting substances, such as stone, brickwork, or wood.

Now, what is the cost of all this, may be inquired? Merely a sum of 4*l.* will suffice for the protection of any moderate-sized house, not exceeding, say, 60 ft. to 80 ft. in height, including all cost.

The question now naturally arises, "Why do we not protect our buildings when the cost is so trifling?" The damage done to property, let alone the question of human life, during a single storm would more than pay for the erection of efficient conductors over dozens of houses. A small outlay, it will be seen, may purchase an absolute immunity from a danger which may at a moment when we least expect it number us among those who are gone from us.

Frank Russell, C.E., Assoc. Soc. Tel. Eng.

ABANDONED.

Few men, even speculating builders, intending to build a tower, or other edifice, fail, in these days, to sit down and count the cost thereof before commencing operations on the site; on paper, however, many structures are fashioned for those who have taken no adequate means to ascertain their willingness or ability to carry out the designs.

Many building schemes are abandoned, and with them, if possible, the architects whose services have been employed. Some would-be builders endeavour to make an express stipulation to the effect that no charge shall be made for the drawings, unless the works they represent are executed; and very often they succeed. Men young in the profession, and blind as yet to their own interests, agree to this, and learn by experience what bad policy it is to become a party to irregular proceedings.

But why should a practice, looked upon as dishonourable by the members of another profession, among architects be considered as optional? If a solicitor undertakes a cause on the understanding that he is to receive his fees only in the case of his client proving successful, he loses caste. It is not that he has committed an act in itself base; but he has, for personal objects, done a thing injurious to the profession of which he is a member. Should not an equally high standard of professional conduct be reached by architects?

In many instances in which the intention to build is abandoned, although no stipulation has been made to meet the contingency, the client expresses great surprise at the amount of the charges which he is requested in due course to disburse. He points out, quite unnecessarily, that he has received no benefit from the labours of the architect, and promises to him future gain in compensation for a lenient consideration of the present case. The architect argues that the Institute "scale" has provided for the possibility of works being abandoned, and that he has made his charge in accordance with it. The client retorts that he hates paying "for nothing."

At length the matter is ended by the architect sorrowfully either braving the wrath of his late employer, or making an abatement from his just fees; so that as William Cowper says of the parson and farmer on tithing-day,—

> —— "he who takes, and he who pays,
> Are both alike distress'd."

Of the alternatives, that of incurring the displeasure of the economist should always be chosen. Would any medical man remit the whole or part of his fees because the patient had died? Would he not very truly say that he was a loser by the death, and that he had hoped to attend the sufferer through his recovery? And might not an architect say as truly that he is a loser by the abandonment of works, and that his hope was to superintend them, and to obtain his full commission?

RAMBLES OF AN INVALID.

It sometimes startles, and not uselessly, those who stay at home, when they hear where less quiet souls have been ranging within a given period. The following portion of a letter from M. Cesar Daly, of Paris, to an old friend in London, will probably have a similar effect:—"In April last year," says M. Daly, "I had a sharp touch of my old bronchial complaint. At the beginning of July I started for Sweden by Germany, where I found hundreds of our cannon forming monuments of every description. I visited Denmark, Sweden (from west to east), going through all the lakes, and assisted, in August, at the Prehistoric Congress of Stockholm, in the name of the Société Centrale des Architectes. Thence I started back through Holland and Belgium, joined my family in the Pyrenees, and, after a month's stay in the mountains, carried my smala off to Algiers, where the boys followed the Lyceum studies. I visited the antiquities in the environs of Algiers, and on the 1st of February started with a military commission through the Eastern Sahara, as far as 800 kil. south of Alger. Two months under tent. Three days after my return, I started with your consul-general, Col. Playfair, for the Aurex mountains, and visited all the principal Roman antiquities of the province of Constantine, taking sketches and notes everywhere. Again two months under tent. I came back through Kabylia with my eldest boy, who joined us at Constantine."

INSPECTION OF THE COVENTRY SEWAGE WORKS BY THE GOVERNMENT COMMISSIONERS.

On Thursday in last week, Mr. Clare Sewell Reade, M.P., Mr. R. Rawlinson, C.B., C.E., and Mr. S. J. Smith, C.E., the commission appointed by the Local Government Board to inquire into the disposal of town sewage, visited the Coventry Sewage Works, which have been established by the General Sewage and Manure Company to put into practical use a plan for the purification of sewage that had been invented and patented by Dr. M. F. Anderson. The commission were accompanied by the Town Clerk of Coventry (Mr. T. Browett), and the city surveyor (Mr. E. J. Parnell), Dr. Anderson, Mr. J. C. Malliss, C.E., and Mr. E. F. Coddington (manager, sewage works), were present to conduct the Commission over the works, and make explanatory observations.

The Commissioners have been appointed to inquire into the disposal of town sewage by three methods, viz.:—1. By irrigation (sewage farm); 2. By precipitation and filtration; 3. By chemical processes. They have visited Bedford, Doncaster, Harrogate, Leeds, Bolton, Chorley, Edinburgh, Glasgow, Wrexham, Banbury, Kendal, Rochdale, Birmingham, Leamington, and Warwick; and on Thursday they inspected the Coventry Sewage Works, and proceeded thence to Rugby. It is expected that they will finish their English tour in about a week, and will then go to some of the principal towns on the Continent; and they hope to be able to make their report before next session of Parliament.

The sewage, as it flows from the city at the rate of about 2,000,000 gallons every twenty-four hours, was first seen, and the visitors were afterwards conducted to a building containing one of Latham's solid sewage extractors, where the straining and extricating of the solid matter was witnessed. The sewage and chemicals having been duly mixed and passed through the precipitating tanks, samples of the effluent water were exhibited in glass test tubes. The effluent water is subjected to a process of filtration, and for the purpose is conducted to a properly-prepared filter-bed. Four and a half acres have been found to be sufficient for the filtration of the effluent water from the sewage of Coventry, but nine acres have been prepared for the purpose of having a second filter-bed ready when the one last in use requires rest or repair. The Commission were conducted to the filter-beds, whence the effluent water could be seen passing into the river Sherbourne from the three large mains of the filter at the rate of about 30,000 gallons per hour. The mode of collecting and drying the precipitated matter was also exhibited. The deposit amounts to about thirty tons or more daily, and if it were to be allowed to accumulate in a semi-fluid state, a nuisance would be created almost as bad as that of polluting the river. It is therefore absolutely essential that the sludge produced shall be daily converted into a portable and unobjectionable condition. It is, therefore, dried, ground into fine powder, and sold as an agricultural manure. The quality of the sewage manure so produced is said to be worth about 40s. per ton. Although there is a fair demand for such manure growing up in the neighbourhood, and also in the hop-growing districts, it has been found by experience that it is too low-priced an article either to bear long carriage or to command the farmer's special attention. Therefore, at the Coventry Sewage Works it is now fortified with other fertilising agents, to enable it to compete with artificial manures. It is fortified by a process patented by the company, and its value can be raised to the extent required. We shall hear by and by what the Commissioners thought of the arrangements.

HANDRAILING.

The cutting out of wreaths for handrailing is admittedly one of the most refined geometrical problems that the practical joiner has to master. Hitherto the system chiefly pursued has been that invented by the venerable Peter Nicholson, for numberless years the joiner's sole guide. In the work now before me* Mr. John Jones states "that having more than 1,000 ft. of handrailing to work for the Commercial Bank, Liverpool, in 1847, he studied how to get out the wreaths with less labour and timber and with more accuracy than cutting them out cylindrically." The result was that he discovered any wreath can be cut out square from a plank of the same thickness as the diameter of a circle enclosing the section of the intended handrail. Or, in other language, a handrail circular in section can be cut out of a plank the thickness of its own diameter: so from this it is self-evident that any mould which could be worked upon such a circular handrail could also be got out *de novo* from the same plank.

To those who are practically acquainted with the usual mode of getting out a wreath, the advantages of this system will be self-evident. Peter Nicholson evidently looked at the question more from the geometer's point of view than that of the practical joiner, considering it as a spiral cut out of a hollow cylinder, the section, in the first place, being a parallelogram enclosing the intended finished section of a handrail. It is a difficult matter to explain without the aid of models; but the advantages of Mr. Jones's system can be seen when it is stated that, supposing a handrail, circular in section, were required to be worked by the usual mode, a plank, thick enough to contain this square section and its twist in the length of the wreath, would have to be provided, and then the circular rail would be worked out of it. In sawing it out of the plank, the saw would have to traverse the plank at angles varying to the plane of its surface, the extra depth of sawing required at the point of greatest twist being a very serious matter.

By Mr. Jones's system this labour is reduced to a minimum, the plank being only the thickness of the diameter of the handrail, and being sawn out square the whole length of the wreath. This is an extreme instance given to illustrate the system. No doubt, were handrails perfectly square in section,—which they never are,—the advantages of the new system would be at a minimum; but still, though no wood might be saved, there would still be a saving in labour. In the real practical work of handrailing there is a saving of about one-third of timber, and fully one-half in time, by the adoption of the new system. It will perhaps bring it clearer to the mind how this saving is effected, if we consider that whatever be the section of the handrail as it advances up the spiral, the section revolves on its own axis. Evidently, then, if our system starts on the principle of an enclosing square, the wreath must be cut out of a plank sufficiently thick to contain that square, through the amount of revolution or twist from one end of the wreath to the other.

I have purposely abstained from any technical description of the mode of setting out the wreath by curves and ordinates, for which I refer those interested to the book itself, where all these practical matters are fully and clearly set forth. The invention is an eminently practical one by a practical joiner, who, I believe, taught it for some years at the Technical School of the then Mechanics' Institute in Liverpool. The system is practised now by some of his pupils in Liverpool. My object in writing has only been to let those interested know what can be done in handrailing through the labours of a thinking mechanic. Would that there were more such to make building the scientific pursuit it ought to be.

T. Mellard Reade, C.E.

Monument to the late War.—The monument to be erected near Metz, but on French soil, in memory of the battles of Mars la Tour, Gravelotte, and St. Privat, has been temporarily placed in the Champs Elysées. It represents France in an erect attitude placing a wreath of *immortelles* on the head of a wounded soldier, whom she is supporting in her arms. At her feet two children seated on an anchor are catching the rifle falling from his hand.

* Handrailing cut Square to the Plank without a falling Mould. By John Jones. E. & F. Spon.

SUDDEN DEATH OF AN ARCHITECT.

Mr. James Woodward, who has acted as architect and estate agent to the Duke of Cleveland, at Raby Castle, for a great number of years, on Monday week left the Castle, in a conveyance, accompanied by a coachman to Cockfield, apparently in exceedingly good health and spirits. Having transacted some building business, on his return, and when near Riverstone, he fell into the coachman's arms, exclaiming "Oh, George!" and instantly expired.

The driver, dreadfully alarmed, was much relieved by Dr. Copeland driving up at the time, and whose opinion is that the deceased died from a diseased heart, and that no inquest was necessary.

UN-SANITARY SIGNS.

(*For the use of the School Board Schools.*)

When streets are foul and scavengers are few,
When drains are choked and sewer-gas leaks through,
When human dwellings have a noisome smell,
You 'll likely find the houses "built to sell."

When infants pine upon their mother's breast,
When parents' looks show illness and unrest,
When doctors prosper where they starved before,
You 'll likely find that deaths than births are more.

When party broils and wars of creed are rife,
When rulers shirk the laws of human life,
When duty means the greed for private wealth,
You 'll likely find a blighted public health.

But if the truth and conscientious deeds
Are shown by men to meet all healthful needs,
Then, and then only, will the sun-burst warm
Break o'er the land in Sanitive Reform.

THE CAMBRIAN ARCHÆOLOGICAL ASSOCIATION.

The thirtieth annual meeting of this Association was opened on the 20th inst., at Carmarthen. Lord Cawdor having taken the chair, the Bishop of St. David's delivered the inaugural address, in the course of which he said,—He might ask them to consider the question, What was the proper work of a Cambrian archæological association? It was very gratifying to observe the progress which the Association had made from very small beginnings. Its organ, the *Archæologia Cambrensis*, had nearly completed the thirteenth volume, and had shown no symptom of failing for want of matter. A great deal of the work which the Association had to do was local in its character; and although in these days it was not easy to say where Wales ended and England began, it still had to be treated in many ways as a separate power of itself. In Cornwall, Wales, or Brittany, on the one hand, and in Ireland, the Highlands and the Hebrides, and the Isle of Man, on the other, we find the lost relics of a widely-diffused group of nations in a greater or less degree of purity, but still in a purer condition than was the case anywhere else. How far were the inhabitants of these countries, say of Gaul and Britain, homogeneous at the period when the light of history first broke in upon them. That light revealed certain ethnological differences between the inhabitants of certain districts. In what did such differences originate? Were they in some measure owing to the partial absorption of a pre-existing race? What remains exist of the pre-existence of such an earlier race, or was it possible to trace it in the feature, habits, or language of any among the present inhabitants of these countries, or in their local nomenclature? What light did monuments throw upon the question? It was necessary that the law should now be put in force for arresting the wanton destruction of national monuments. One class of such monuments only needed to be let alone. If camps and other earthworks were not levelled or ploughed away; if cromlechau were not blown up or turned into gateposts; and if inscribed stones were simply protected and undisturbed, nothing more was wanted or could be expected. He could not conceal his regret, as an archæologist, that the zeal for church restoration had not at all times been according to knowledge. He believed it required a greater architect to restore a church than to build one. An architect who dealt with one of the rude, solemn, quaint Welsh country churches, wanted not merely artistic skill, but something of poetical feeling. Those churches needed to be treated with the most reverent care. He thought their Society had done a great deal, but he was quite sure it had still very much more to do in the way of stopping unadvised and hasty restoration.

After an excursion to Llanstephan Castle, and the mansion of Sir James Hamilton, there were various meetings and papers read, followed by discussions, the history of Wales being considered as deserving to be written.

HYDRAULIC LIFTS FOR CANAL VESSELS.

The trustees of the River Weaver navigation have recently applied the principles of hydraulics to an invention in lifts that may, in time, supersede the builders' crabs and windlasses for lifting masonry and other heavy materials. The site of this new invention is at Anderton, where the Trent and Mersey Canal, on its way to Runcorn, approaches the River Weaver, and where there is a considerable transit proceeding from the iron and pottery districts to the sea at Liverpool; but as the canal is more than 50 ft. above the river, the whole of the trade has had to be transhipped at a great expense and labour.

The river vessels are now raised at one lift up to the level of the canal, and also lowered again. The lift consists of two wrought-iron tanks, or open pontoons, situate side by side, and each of equal section with the canal, and of a length sufficient to receive the longest of the vessels which navigate the canal. One pontoon descends while the other ascends, the time occupied in making the ascent and descent being, on an average, about three minutes. Each pontoon is fitted with ends that lift up when connexion has to be made with the canal or the river, thus allowing a free passage for the vessels out of or into either. These lifting ends, and the junction of the pontoon with the iron branches of the canal, are all made perfectly water-tight by means of very ingenious arrangements of india-rubber packings, which are brought into operation by the motions of the lift and the pressure of the water.

The practical construction of this lift has been divided between Mr. Edwin Clark and his representative, Mr. T. Duer, under the inspection of Mr. Sandemann, the engineer of the Weaver Trust. The works were carried out by Messrs. Emmerson & Co., builders and contractors.

THE REMOVAL OF THE SEA.

Sir,—That bottling off of the sea to which you referred in your issue of July 31st, is by no means a very difficult or great undertaking, and will in all probability turn out a very can-tankerous affair.

But there is another more important tapping of the sea in contemplation, in order to fill up that vast sandy flat and vat, the Great Desert. Even this would not in itself be a very stupendous feat; nevertheless, I am not exaggerating when I say that the tapping of the ocean for such a purpose would not only involve momentous changes, but tremendous consequences, even to the possible disturbance of the balance of all terrestrial things. Whether this contemplated removal of the sea would be for good or ill to mankind may possibly be within the powers of calculation of some of your astronomers. The submergence of the desert would certainly affect the earth's orbit, its axial rotation, the tides, and the sea margins. As Nature has herself emptied the Desert of the Sea, I would rather myself trust to her engineering, than revert to a præ-historic state, to a stage in the earth's development, which Nature has long since cancelled. But a poor camel is not blessed with that human reason which can probably demonstrate that this projected removal of the sea would not only be of advantage to the merchants of London and Timbuctoo, but that the Universe would be benefited by the change; they tell me that science has long since settled all the troublesome details of fact, and is now entirely deductive in her proceedings. Men have only now to ask themselves if anything be of advantage to the English trader, and if it be it will necessarily follow that it will also be for the benefit of the vested interests of the entire Universe. Otherwise I should have suspected that if this project of swamping the desert were to be carried out, the white populations of the Globe would have to look black as well as those of the Niger. I should like to inquire of Mr. Darwin for what special purpose we camels were created, and why we were called the ships of the desert? Is our

kind to be wrecked in the way proposed? The submergence of the desert would certainly take a great weight off our humps and shoulders, but our occupation and seven stomachs would be gone. But what matters that, as long as there are turtle, and there are aldermen? To save us, Mr. Editor, please tell the aldermen that if the sea be removed, turtle will, in a few days afterwards, be extinct everywhere but in aquaria.

A Camel.

INLAND NAVAL ARSENALS.

Sir,—It is, on all hands, agreed that England ought to be made as impregnable as human skill can make her. All our great naval arsenals are too much exposed, and, therefore, ship-building might be considerably impeded in the case of war. The defence of our present dockyards is difficult, and to effectively fortify them is a work of enormous cost. I would suggest that one or two *inland* naval arsenals should be established on the lakes, which are in the midst of our island fastnesses,—of our natural fortifications. There fleets could be built, and lie in safety till ready for sea, or even under some circumstances the fleet itself might form a ship citadel. Thus, in the event of any reverses in the south, our position in the north might be rendered completely impregnable, and enable us, either by land or by sea, to retrieve possible reverses. Coal and iron would be at hand, and therefore could be readily and economically utilised.

W. Cave Thomas.

GENERAL FOREMEN AND CLERKS OF WORKS.

BRICKLAYER *v.* CARPENTER.

Sir,—Your correspondent, under this heading, very truly remarks that a carpenter and joiner is generally advertised for, and preferred, to occupy the position of clerk of works. I am quite willing to endorse this statement, but, I think, those that follow, pointing to the bricklayer as the proper person for the place, are not altogether correct. This question should be viewed from a broader basis than that assumed by "Bricklayer," which can be best done by noting the effects of the two trades upon the minds of the respective workmen.

The carpenter and joiner in preparing himself to be a competent tradesman, has to obtain a thorough knowledge of the principles of construction, and also to apply those principles in the timbering of the floors and partitions, trimming for the various openings, and more especially in the construction of the roof, which not unfrequently calls into play a great deal of brain power and mechanical ingenuity. The roof holds a very important position in any building, and it is there that the science of construction culminates.

It is not an ordinary mind which can grasp the formation of an elaborate roof in its entirety, and also in detail, and it is in such cases that the knowledge and training of the efficient clerk of works is called into requisition.

Your correspondent states that a competent joiner passes all his early life in the workshop, and does not appear upon the building until the superstructure is complete. It is very certain that a number of years must elapse before a man attains that manipulative skill and practical knowledge which qualify him for a joiner; but his education is not even then complete. After acquiring that knowledge he has to gain a large experience in fixing, &c., before he is in a position to accept a leading situation. It is necessary for him, therefore, to be a carpenter as well as a joiner before he attempts this.

Now, a carpenter's advent upon a building occurs almost as soon as the bricklayer's; for, has he not to prepare the centreing, lay the joists, and erect partitions, as the work proceeds? Indeed, if it were not for the carpenter the bricklayer's operations would soon reach their limit.

I have had some experience both in bricklaying and carpentering, and I am of opinion that the former is by far the most mechanical trade, and is much more readily acquired than the latter. Again, the ordinary bricklayer has not nearly the facilities of the carpenter for acquiring that extensive and varied knowledge of the attendant trades, which is absolutely necessary for a man holding so responsible a situation as clerk of works.

You see the bricklayer's ordinary work, consisting, as it does, of such a continual repetition, does not compel any mental exertion, consequently the mind does not become educated, and the man settles down with quiet contentment to lay bricks. Besides, should a bricklayer endeavour to acquire the necessary command of other trades, the difficulties he has to contend with are far greater than those of the carpenter, inasmuch as the latter has already acquired that practical knowledge of construction which is the key to all building operations.

It is quite possible for an ordinary carpenter to construct a good house by himself; but I think if a bricklayer were to attempt the task he would be somewhat troubled.

I have purposely written this letter to apply to ordinary house-building, as the more elaborate the work becomes the greater is the knowledge demanded, and the tradesman who is not qualified to control a small building would certainly be incompetent to take charge of larger works.

On buildings where stone is used in lieu of bricks, the mason supersedes the bricklayer, but the carpenter still retains his leading position. My previous remark respecting the education of the mind is still further evidenced by the mason, as the more he studies and thinks of his work, the more nearly he approaches to the standard of the art-workman, leaving far behind the mechanical drudge whose work is truly manual labour only, giving no evidence of the higher powers which, through disuse, are nearly obliterated.

How is it that the mason puts not forth his claim? It is because he truly understands his relative position, and does not endeavour to force his work (being chiefly artistic) into collision with the more scientific labours of the carpenter.

One word in respect of the "load of prejudice" under which the bricklayers labour. It is certainly a fact, and one to be lamented, that bricklayers, as a rule, do not receive the education which carpenters and joiners do; besides the nature of their occupations, being so monotonous, has a tendency to dull the brain, and does not excite that active interest which is awakened by the ever-recurring novelty of the joiner's work. I therefore say that it is not prejudice, but a stern fact, that the bricklayer is not so well qualified as the carpenter to be recognised as the leading tradesman. This is so very generally acknowledged, both by precedent and present custom, that comment is unnecessary, but still I join with "Bricklayer" in saying, "Let the best man win."

E. L.

THE WIDENING OF LONDON BRIDGE.

Sir,—It appears to me that the plan proposed for the widening of London Bridge will, if it be carried out, destroy its fine aspect. The employment of iron girders, which should saddle the bridge, and whose ends would only have the appearance of cantilevers, would be a very strong form of construction, and one which might be made ornamental. This plan would admit, too, of longitudinal girders being connected with the transverse, so as to strengthen the entire structure of the bridge.

Hundredweight.

LIABILITY TO REPAIR ROADS.

THE KENSINGTON VESTRY *v.* THE VESTRY OF ST. MARGARET AND ST. JOHN, WESTMINSTER.

At the Hammersmith Police-court, Mr. Harding, the Clerk to the Kensington Vestry, stated that their parish claimed of the defendants the sum of 87*l.* 6*s.* 9*d.*, being their apportioned expenses for the repair of Marloes-road under the compulsory powers of Acts provided. Under the Westminster Improvement Act, the parishes of St. Margaret and St. John had power to purchase a site for a new workhouse. The Act also specified that the land should be deemed as part of those parishes. In pursuance of that power, plots of land were purchased in Marloes-road, and a workhouse was built upon the site, the whole being in the parish of Kensington. The road had lately been repaired by the parish of Kensington, and the sum sued for was the estimated share apportioned on the parishes of Westminster.

Mr. Bridge said it would be very hard on the owners of houses in Marloes-road if they were called upon to pay the whole amount, and he had no hesitation in deciding in favour of the Kensington Vestry.

Mr. Rogers, Vestry Clerk for the Westminster parishes, asked for a case for the opinion of a superior court, and contended that his parishes were not liable. Another objection was that they feared that the Poor-Law auditor might not pass the amount if once paid, and would surcharge those who signed a cheque for the amount.

Mr. Bridge expressed surprise, but was quite willing to grant a case; but the effect of this miserable quarrel would be to saddle the ratepayers with heavy costs. He thought his order would protect the Vestry from being surcharged.

An order for payment was made.

STRIKE AT TUNSTALL.

On Thursday evening, the 12th instant, Mr. Grosvenor, builder, of this town, unexpectedly received notice from his bricklayers and labourers working at the Primitive Methodist new schools and a number of houses in Henry-street, for an advance of wages, the bricklayers 1d. per hour (from 7d. to 8d.), the labourers ½d. per hour, increase. On Saturday morning they demanded a satisfactory answer. Mr. Grosvenor at once told them most decidedly he should not give any advance under such circumstances, and referred them to the rules of the society agreed to by masters and men, which require six months' notice for any alteration of terms, such notice to be given at other times than in August. The men replied that some sub-contractor on the railway was giving the increased wages, and therefore they required the same. Mr. Grosvenor still refusing the advance with such notice, the men left him at a few hours' notice, thereby putting him to great inconvenience, he having large contracts in different parts of the country.

SOLIDIFIED CEMENT.

Sir,—Strolling out one evening last week from Darlington, I came to a railway bridge crossing the river Tees at Low Cownscliffe; upon going to the water's edge I noticed a number of what seemed to be sacks of flour, but, upon examining them, I found them to be blocks of solid stone, with the fragments of the sacking still upon them, the marks of the sacks, the seams, the shape at the bottom, and the tying at the mouth being complete. On inquiring I learnt that five or six years ago, when the foundations of the bridge were being made, the sacks of cement were on the water's edge, when one night a freshet came down the river, covering the sacks, and turning the cement into stone, a fragment from one of which I enclose, it taking a deal of labour to chip off. The remains of a dozen can be counted.

T. B. B.

CLAIM FOR PERSONAL INJURIES.

IMPORTANT TO BUILDERS.

In the County Court, Walsall, Harry Walters, slater, Walsall, sued James Tute, builder, of the same town, for 25*l.* as compensation for personal injuries, the issue being sent down for trial from the Court above. The plaintiff's case was, that in February last the defendant had a contract for the building of some houses and outbuildings at The Pleck for Mrs. Bowen, his contract requiring him to provide all materials. During the erection of the buildings he made a contract with Mr. Oliver Joynt to do the slating, and on the 6th of the month named, as the plaintiff, who was with Mr Joynt, was cutting off the ends of some laths which projected from the brewhouse, a rafter upon which he had occasion to rest broke through the middle, and he fell down on to the floor of a sort of passage, a distance of 10 ft., and sustained a compound fracture of the right leg. While he lay upon the ground, immediately after the fall, he picked up a broken rafter, and found that at about the middle of it there was a large dead knot, extending from side to side, and within ½ in. of the top, and to within ⅜ in. of the bottom; but afterwards when an attempt was made to find it, it had disappeared. By consent, a verdict for 80*l.*, including costs, was entered for the plaintiff.

A SUB-CONTRACTOR IN A FIX.

At a meeting of the St. George's Union last week, the clerk read the following sub-contractor's appeal:—

"*To the Committee of Building Works, St. George's Union.*

31, Church-street, Chelsea.

I have taken the liberty of addressing you respecting the following:—I unfortunately entered into a contract with Messrs. Thorn & Co. to execute the plastering of the above works, and have now executed work with materials on the ground to the amount or about 250*l.*, towards which I have received nothing.

Being a serious loss to me, I beg to ask if you will allow me to remove my materials not used, and also my plant, which would be of about the value of 40*l.* By so doing I would be truly thankful.—W. J. Taylor."

The applicant was informed that the guardians could not give the permission; that he was in the same position as the contractors, Thorn, whom alone could be recognised.

Mr. Jas. Fergusson.—The Fould Prize, awarded triennially by a commission of the Paris Academies of the Inscriptions, Sciences, and Fine Arts, for an historical work on the Fine Arts, has not been awarded this year. According to the *Times*, Mr. James Fergusson's "History of Architecture" has been found the work of most merit, though not fully answering to the conditions, and the revenue accruing from the bequest has accordingly been awarded to him for three years.

CHURCH-BUILDING NEWS.

Grosmont (York).—The new church of St. Matthew was opened on the 13th inst. by the Archbishop of York. The church consists of nave, north and south aisles, chancel, organ chapel, and vestry in the lower chamber of the tower. The exterior of the edifice is plain. The church is built upon an acoustic principle derived from a musical chord, and discovered by Mr. Armfield. The aisle walls are built upon the foundations of the original church; the length of the nave has been increased as far as the outer wall of the old tower; the aisles are divided from the nave by an arcade of four bays on each side, carried on cylindrical columns, with carved caps and bases. The nave roof, is of a hammer-beam construction, with curved ribs, the portion below the hammer-beam forming groins starting from the capitals of shafts, each alternate one of which is carried down to the ground in front of the columns supporting the nave arcade and clearstory. The portion above the hammer-beam is boarded to the curve of the principals. The seats are open framing, and varnished; the heating is by the Derwent Foundry Co., Derby. The chancel is entered through a lofty moulded arch of two orders, the outer order carried on a checked pier ornamented with banded shafts, the inner order is carried on a respond. There is a rise of seven steps to the altar. The three-light east window and the triple-light in the north wall, are filled with stained glass. The chancel is built of cleansed local stone, and in the sacrarium are sedilia and piscina. The roof is curved to the same radius as the chancel arch, and is divided into panels with moulded ribs. The stalls and organ screen are of moulded oak. The floors are laid with Maw's encaustic tiles. The works have been designed by the architects, Messrs. Armfield & Bottomley, of Whitby, and carried out under their superintendence by the following contractors:—Mr. William Barton, mason; Mr. William Robinson, joiner; Mr. David Richardson, joiner; Mr. John White, joiner; Mr. Joseph Hardgreaves, slater; Mr. J. Brown, plumber; Mr. I. Bolton, plasterer.

Blackwood (near Newport, Monmouthshire).—On the 16th inst., a foundation-stone of a new church here, to be dedicated to St. Margaret, was laid by Miss Williams, of Maesruddud. The church, which is designed in the Early English style, will consist of a nave, 58 ft. long by 24 ft. 6 in. wide, a chancel, 28 ft. long by 20 ft. wide, a small vestry and organ-chamber, and a south porch. The gable, at the west end of the nave, will be surmounted by a bell-cot. The church will be built of a local stone obtained from a quarry at the back of the site, and Bath stone dressings. The walls of the nave will be 15 ft. in height to the wall plate, and will carry an open-timbered roof. The height from floor to ridge will be 35 ft. Accommodation is provided for 224 persons, but at present it is only contemplated to build the nave, which will hold 200 adults. Mr. Bowes A. Paice, of London, is the architect, and the contract has been taken by Mr. Esau Hargest, builder, of Merthyr Tydvil.

Wimborne.—The foundation-stone of a church about to be erected in the New Borough, Wimborne, has been laid. Mr. Walter J. Fletcher, the county surveyor, is the architect, the builder being Mr. Augustine H. Green, of Blandford. The building is dedicated to St. John the Evangelist, and the cost is estimated at about 3,000*l*. The site has been presented by the Hanham family. The style of architecture is to be the Early Decorated, the ground-plan being in the form of a cross, with two transepts, north and south. There will be no aisle. From the west wall to the apse the extreme length of the church will be 82 ft., the width being 24 ft. Fareham red bricks, with exterior Doulting stone dressings, will be used in the construction, the interior dressings consisting of Corsham Down stone. The roof will be open-timbered, plastered between the rafters. There will be open seats to accommodate 400.

Alstonefield.—The chancel of this church has been re-opened after restoration. The original building was Norman. The chancel arch and a doorway in the south wall are all that remain of the original structure, if we expect a gurgoyle in the tower and fragments of the churchyard cross, one of which is built into the north aisle wall, and several others which have been discovered, during the restoration of the chancel, built into the wall over the chancel arch. The chancel is Early English, and three small lancet windows, deeply splayed, remain. The tower is Decorated, and the body of the church, speaking generally, Perpendicular, with a very plain clearstory, but, in the wall of the south aisle, two elegant windows of that period. The pewing of the church is of carved oak of the time of Charles I., and is in excellent preservation. The restoration of the fabric of the chancel has been carried out at the expense of Sir John Harpur Crewe, bart., the lay impropriator. Mr. Edward Purchas, of London, was the architect, but shortly after the completion of the designs he was disabled by illness, and the superintendence of the work devolved upon his brother, the Rev. W. H. Purchas, vicar. The walls of the chancel have been made sound, some interesting Early work has been disclosed, a new open-work roof has been put on, and in place of a debased Perpendicular window at the east end one of the Decorated period has been inserted. The east window has been filled with stained glass by Burlison & Grylls, of London. The centre light contains a picture of the Crucifixion, and on either side stand St. Peter (to whom the church is dedicated) and St. John. Beneath are three groups representing the Journey of the Wise Men of the East towards Bethlehem, their Adoration of the Infant Saviour, and their Appearance before Herod. The builder is Mr. Woodisse, of Hope, Alstonefield.

Middle Littleton.—The church of Middle Littleton was reopened, after having undergone further restoration, on the 13th inst., on which occasion an additional piece of burial-ground, given by Lord Northwick, was consecrated by the Bishop of the diocese. The present work has included a more thorough restoration of the edifice than that carried out some time ago, with the exception of the tower, which is still much in need of attention. The parishioners, under the direction of the vicar (the Rev. H. E. Godfrey Faussett Osborne), have already restored the other church, of which Mr. Osborne has the charge as well, and built new schools. The chancel has been adorned by the addition of a reredos, and other improvements have been effected. The designs for the restoration were prepared by Mr. Preedy, the architect.

Campden.—A contract has been entered into for the restoration of this church, which has been commenced. The present contract extends to the repair of the roofs of the north and south aisles and north transept, the restoration of the parapet and turrets of the tower, the enlargement of the vestry, the formation of a dry area around the church, the reglazing of the whole of the windows, the putting in of heating apparatus, and the fixing of a lightning conductor to the tower. The north gallery has already been removed. The work of restoration will consist of the removal of the western gallery, the opening out of the west window, the repewing of the church, and other matters. Messrs. Patman & Fotheringham, of London, are the contractors; and Mr. Habershon is the architect.

Birmingham.—The work of renovating and decorating St. Thomas's Church, though not yet completed, is so far advanced that the building was re-opened on Sunday last. Hitherto St. Thomas's has been devoid of all internal ornamentation to relieve the plainness and cold appearance of the building, beyond what was furnished by whitewashed walls and a whitened flat ceiling. The panels of the ceiling are painted a rich blue, with buff "styles" or margins, the larger bands being a French grey, with gilded intersections and fret ornamentations at returns. The cove has Greek honeysuckle enrichments on a buff ground. The walls generally are a French grey, the architraves of the windows being worked in buff, with a leaf enrichment. The gallery fronts, which before were simply oak-grained, are now worked in a combination of colours, consisting of browns, maroon, and blue, with an enrichment worked on a gold ground, while the columns supporting the galleries are a bright blue, with gilded capitals and maroon bases. The centre panel of the ceiling bears the monogram "I.H.S." in gold, and on the panels on either side there are devices worked in gold on a blue ground. The pews are painted a dark colour and varnished. The cost will be about 500*l*. The architect was Mr. Yeoville Thomason, from whose designs the work has been executed by Mr. Seers.

WATERTIGHT PONDS.

Sir,—Having lately constructed some Ponds with concrete on a large farm, for agricultural purposes, and as yet they do not prove a success, not being perfectly watertight, could any of your readers give me any suggestion in making them so, at the least expense, by any other means than cementing them? We have at least the advantage of a good firm bottom to work on. R. S. W.

DISSENTING CHURCH-BUILDING NEWS.

Broughty Ferry.—On the 26th ult. the foundation-stone of the Queen-street United Presbyterian Church, which is being erected for the congregation worshipping in the Public Hall, Broughty Ferry, was laid by Provost Cox, of Dundee. The church is in the Geometrical Pointed style of architecture. The entrance, being at the south-west corner, gives access under the spire to a corridor, in the centre of which is the inner door to the area; passing over the tower porch is a gallery staircase; contiguous to the corridor are ladies' cloak and retiring rooms. At the opposite or pulpit side of the church are an organ apse and choir-room, approached by special entrance at the end. There is a third external door, intended to communicate with future vestry and lecture-hall, but in the meantime serving as means of egress to the congregation. The church has been arranged on plan as nave and aisles, separated from each other by iron columns. This arrangement is expressed externally by gables pierced with vertical and circular windows. At the entrance, or south-west angle, are the tower and spire. The church is to be arranged to accommodate 575 sitters. All modern church appliances have been provided for. Messrs. Maclaren & Aitken are the architects, and the designs are being carried out by Messrs. A. & J. Black, masons; Mr. James Steven, joiner; Mr. Murray, plumber; Mr. Fyffe, slater; and Messrs. Adam & Son, plasterers. The cost will be about 3,500*l*.

Rossett.—For about sixty years past there has been at Rossett a Presbyterian church, situated by the side of the turnpike-road, near to where there was a ford which had to be used by vehicles. Accidents having taken place, it was considered advisable to erect a bridge, for which purpose the road was diverted: the chapel was therefore not in so favourable a situation as it was previously, and it was found necessary to erect a new building. Mr. Alexander Balfour, of Liverpool, gave the site, which was purchased for 260*l*., and is situated in a prominent position on the high road. The building is estimated to cost 800*l*. The architect is Mr. Douglas, of Chester, and the chapel, which will accommodate 250 persons, will be of Gothic design, its outer walls being of rubble faced with Cefn stone.

Dorchester.—The foundation-stone of a new chapel about to be erected by the Primitive Methodists in Durngate-street has been laid; the site has been given by Mr. H. G. Sturt, M.P. The building is designed in the Early Gothic style. Externally it will be built of Broadmayne bricks with stone dressings, the walls built hollow and at a ground level a course to exclude damp. The gabled front has four buttresses, the two corner ones have quadrangular pinnacles with carved finials; the apex of the gable an iron ornamental finial. The front entrance, in addition to the stone jambs and arch, will have a column on each side with carved cap and moulded base. Over this doorway is a triple window with traceried head. The spaces between the buttresses on each side of the door have lancet windows. There are five buttresses projecting on each side, and between each are two-light windows. The roof will be covered with Bangor slates, with courses of Penmoyle green slate, the ridge having ornamental tile cresting. The roof principals are partly exposed. The walls are boarded from the floor above the pews, and the upper part stuccoed. The internal fittings are of pitch pine, stained and varnished. The chapel is 31 ft. by 39 ft., and 17 ft. high; at the sides of walls 26 ft. 6 in. to ceiling; and will accommodate 200 persons. Mr. Samuel Jackson, of Weymouth, is the architect; and the work is being executed by Messrs. Davis & Son, of Dorchester, the contract price being 600*l*. Ground is reserved for extension of the chapel, and erection of a school-room.

Eastwood (Rotherham).—Four memorial stones have been laid of a new Wesleyan chapel here. The building will accommodate about 800, and will have a gallery all round; the one at the north end, which is over the vestries, will be for the organ and singers. Under the chapel is a large school-room, with class-rooms; also heating-cell, kitchen, lavatories, &c. The chapel is approached in front by a wide flight of steps leading from the street, and the fittings are pitch-pine varnished. The cost, exclusive of site, will be 3,000*l*. The architects are Messrs. Tacon & Rawson, of Rotherham; and the builder is Mr. Thomas Saul, of Mexborough, near Rotherham.

Chesterton.—Latterly, from the increase of the population of Chesterton, the Wesleyan chapel has become much too small for the congregation connected with it. Consequently the trustees have decided upon the erection of a new place of worship. The site is near the present chapel, and occupies a commanding position in the district. The memorial stones, four in number, were laid on the 16th inst. The building will be erected from the designs of Mr. G. B. Ford, architect, Burslem. The design of the chapel is Italian in character. The gallery will be extended on three sides, and the building will seat about 550 persons. The chapel will be erected by the Rose Vale Building Company, and the cost, inclusive of 400*l.* for the site, will be about 2,400*l.*

NEW ASSIZE COURTS AT NEWCASTLE.

The present assize court sat Newcastle for the transaction of the county and town business, having for some time been found to be altogether unsuitable for the purpose, the county and town authorities contemplate the erection of entirely new courts, in which the assize business of the county of Northumberland as well as that of the town of Newcastle, shall be conducted under one roof. It appears that the existing courts are not only small and inconvenient in themselves, but that their situation, in immediate proximity to the railway, has frequently called forth complaints from the judges on circuit, owing to the constant annoyance kept up by the railway whistle. The subject was taken into consideration last week, at the Midsummer sessions of the county of Northumberland, when the presentment by the assize grand jury recommending the erection of new courts was discussed. The mayor of Newcastle, one of the magistrates present, said it was on every ground desirable that new courts should at once be built, and there would be no difficulty whatever in raising the money required, which it was estimated would be from 100,000*l.* to 120,000*l.* The only difficulty would be the making of arrangements between the county and the town as to joining in the cost. It was finally agreed that new courts should be erected, and a committee of magistrates of the county was appointed to confer with a committee of the Newcastle town council as to the best means of carrying out the object.

SALE OF PERDISWELL HALL.

Perdiswell Hall, near Worcester, one of the most ancient seats in the county, and which has been identified with the family of Sir Offley Wakeman for many generations, was last week brought to the hammer. The house was rebuilt about sixty years ago, at a cost of about 20,000*l.*, and it was stated at the sale that it had taken the Wakeman family nearly a century to get the property together. In offering it for sale, the auctioneer stated that, if divided, the estate ought to fetch 200*l.* per acre, and in that event it would realise about 24,000*l.*, the estate comprising an area of 120 acres. After some active biddings, the property was knocked down to Mr. John Skipworth Gibbons, of the Leasowes, Halesover, Worcestershire, for 24,000*l.*, in addition to which the purchaser had to take, under the conditions, a portion of the timber on the estate valued at 1,350*l.*

THE OPENING ADDRESS: BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The truth is not always pleasant: still it ought to be told. Sir John Hawkshaw's address at Bristol, on Wednesday, was a failure, and is so considered by all who heard it,—quite unworthy of himself and the Association, as, although containing some curious matter, it can, for the most part, be found in elementary works.

Foundation-stone, Stanley.—On the 17th inst. the foundation-stone of the new church of St. Thomas, to be erected at Stanley, near Crook, was laid. The parish is entirely a new one, and has a population of about 4,500. The building, which will seat between 300 and 400 persons, will be erected on land given by Messrs. Bolckow, Vaughan, & Co., large coalowners in the neighbourhood, and when finished will cost nearly 3,000*l.*, 2,000*l.* of which sum have already been subscribed.

THE STAR THEATRE AND MUSIC HALL, BRADFORD.

A new place of amusement has been erected near the bottom of Manchester-road. The music-hall portion was opened on Monday last. This section of the building is for all practical purposes separate from the theatre that will be erected on the top of it. To adapt the building somewhat to the shape of the piece of ground upon which it has been built, the main façade has been erected in the form of a crescent. The front is not a very ornate one, strength and simplicity seeming to have been the qualities more particularly aimed at by the architects. There are two arched doors in the centre of the front, entered on a level with the street, one of the doors leading to the pit, and the other to the upper seats,—balcony, promenade, boxes, &c. There is also an arched door at each corner, opening directly into the street, the one on the left being the stage-door, and the one on the right an extra exit door for the pit. The pit is reached by a descent of twenty-eight steps, and the arrangements are such that if visitors find on reaching the bottom of the first staircase that the seats in that quarter are occupied, but there is room on the other side of the hall, they have simply to pass on through a corridor that runs under the stage to get into the pit on the opposite side to that on which they entered. The music-hall will accommodate over 2,100 persons, 1,000 in the upstair seats and 1,100 in the pit seats; besides which there are private box occupiers. The height of the building from floor to ceiling is 32 ft.; it has an average width of 70 ft. The stage is 6 ft. from the floor of the pit, and the proscenium opening is 26 ft. wide by 21 ft. high. From wall to wall the width of the stage is about 50 ft. and it is 19 ft. in depth. The balcony or gallery of the hall is raised 8 ft. 6 in. from the bottom of the pit at the front, and 10 ft. at the back, being supported by a number of massive iron pillars. There are six rows of seats round the balcony, each 2 ft. 8 in. in depth, and from 18 in. to 22 in. in height, one above the other. At the top of the balcony there is a promenade capable of accommodating a large number of spectators. The balcony will seat 400 persons. There is a fall of 4 ft. 6 in. from the back to the front of the pit. The hall is lighted by twelve sunlights,—three on each side on the upper floor, and the same in the pit, the hot air being carried off by sheet-iron flues.

The scenery has been painted by Mr. Samuel King, of Bradford. Mr. Charles Fox, of London, has painted the act-drop. Messrs. Jackson & Longley, of Bradford, are the architects; and the following Bradford tradesmen have done the various works in connexion with it:—Mr. H. Birkby, mason; Mr. John Shepherd, joiner; Messrs. Howroyd & Sons, plasterers; Messrs. Sutcliffe & Wilkinson, plumbers; and Mr. Samuel Oddy, painter.

BURSTING OF A RESERVOIR AT CARDIGAN.

On the 17th inst. the upper or new mill-pond, in connexion with the Cardigan brickworks, about a mile and a quarter from the town, burst. This reservoir, in extent about seven acres, is formed in a natural hollow about 150 yards above New Mill, a barrier across its mouth damming up the water, and was provided to supply water to the machinery at the brickworks. Below New Mill is another pond, formed some years ago to provide water for the Cardigan flour-mill; below this the stream flows under Tregibby Farm to Stepside Farm, and thence to the Mwldan brook and brickyard. Owing to the heavy rains in the night the upper reservoir had become full, and on the men going to open the sluices to relieve the pressure against the embankment, it was observed to be giving way, and the men had scarcely time to escape to give notice at New Mill before the whole front of the pond gave way, and the water rushed down in an immense wave, destroying the waterwheel of Capel Farm in its course to New Mill, and committing great havoc, and destroying the Stepside Bridge. At the brickworks the damage done is immense. Passing the brickyard the water assumed the appearance of an immense wave, flooding portions of the Bathhouse Farm, and carrying away a rick of hay as it stood, which, in its course downwards, struck against a house, which, with its contents, was utterly demolished. From here down to the river Tivy, every house in the Mwldan was flooded, and two lives were lost. The slaughter-house and Middle Mwldan bridges are thoroughly destroyed, and the Upper Mwldan bridge partially so.

The Town Council took immediate steps to shelter the people who had lost their all. The loss is estimated at 12,000*l.*

THE RUINS IN IONA.

In the summer of 1873, the Duke of Argyll requested Mr. R. Anderson, architect, Edinburgh, to visit the island and report as to the best mode of dealing with the buildings, which, up to that time, had been left for the most part to fight their own battle with the elements and other destructive agencies. Operations were commenced in the following season, and were continued through the months of August, September, and October. April of the present year saw the work resumed. The general results attained are of a satisfactory character. The accumulations of soil and rubbish which concealed large portions of the ruins have been cleared away, so that the plans of the nunnery and monastery can now be made out. Four of the seven chapels have also been restored to view, and, in the case of these, as well as the other buildings, steps are being taken to preserve the walls from further decay. One cause of dilapidation has been the removal, for ordinary building purposes, of the squared stones forming the jambs of doorways or the angles of walls. The gaps thus created have been filled up with solid masonry similar to that which had been picked out, and in this way the walls have been put in a better position to resist the effects of rain and frost. The freestone for this purpose has been obtained at Carsaig Quarry, on the island of Mull, from which, it is understood, the material for the building was originally procured. In the course of the excavations which have been made, a large number of sculptured stones have been turned up, and these, of course, have been carefully preserved.

CASES UNDER METROPOLITAN BUILDING ACT.

Mr. Thomas Jenner, the builder of three houses in Shirland-road, was summoned on August 21, before Mr. Mansfield at the Marylebone Police-court by Mr. Horace Gundry, district surveyor for Paddington, for omitting to render the backs or outsides of the flues as required by the 4th rule of the 20th section of the Metropolitan Building Act.

The defendant argued that the proceedings were premature as the plastering of the houses was not even commenced, but the district surveyor pointed out that such parts as are covered by the floors and roofs should be rendered before the timbers are fixed.

Mr. Mansfield asked what was the object of plastering those parts, and the district surveyor explained that it afforded a great security against the escape of smoke and heat.

Mr. Mansfield ordered the work to be amended in seven days, and the defendant to pay costs.

ARCHITECTS' RESPONSIBILITIES.

PRANGNELL *v.* STRATTON.

The plaintiff in this case, at the Bristol Assizes, was a brickmaker, living at the Isle of Wight, and the defendant was an architect, carrying on his profession at Newport, in the Isle of Wight. In the month of May or June, 1873, the defendant was employed to build a house for Mr. Alpe at Freshwater. The defendant called upon the plaintiff's wife, and, saying he was about to build a house, inquired whether the plaintiff would supply the bricks. She asked who was to be the builder, and Mr. Stratton said Mr. Kennett. In consequence of something she said the defendant stated that he would be answerable, and the bricks were supplied. Defendant paid for some by a bill of 45*l.*, which was honoured, and a cheque for 75*l.* He accepted another bill for 49*l.*, and there was a balance due of 119*l.*, upon which sum 6*l.* interest had been charged, and it was to recover these amounts that the action was brought.

For the defence it was contended that the credit was given Kennett, and that all that defendant had undertaken to do was to stop back money for the bricks supplied by the plaintiff from the instalments becoming due to Kennett for the building of the villa, and that in that way he had given the acceptance for 45*l.* and a cheque for 75*l.*

The jury gave a verdict for plaintiff for 119*l.*

A Church Struck by Lightning at Blundellsands. — The new church of St. Nicholas, Blundellsands, was struck by lightning during the recent heavy storm. The stone cross which surmounts the gable at the west end was knocked down, and broken in pieces, doing some damage to the roof in its fall, and a strip about 2 ft. wide of the slates, from the pitch of the roof down to the gutter, was entirely removed, the broken slates being scattered in all directions. Some men who were sheltering under the wall narrowly escaped injury.

SANITARY AND ÆSTHETIC SCHOOLS WANTED.

Sir,—The parish school named in the *Builder* of the 14th inst., as Leberton, should have been Liberton, little known to fame further than in Scott's "Heart of Midlothian," where it is mentioned as the scholastic field where Reuben Butler, the sweetheart of Jeanie Deans, taught as assistant dominie.

Visiting the school-house yesterday, I was surprised to find that the recently formed school-board had ignorantly removed the vertical fresh-air shafts of the Taylor (?) Tobin (?) system, such being far a-head of their conceptions in ventilation, where there were windows that could be opened if wanted, and the regulation holes in ceiling, and air-gratings provided in floors. In fact, the School-boards throughout Scotland, now building with undue haste so many hundreds of schools, have no other system of ventilation, even where the walls and windows are low, and the ceilings carried up to the roof-ties. No consideration is given to provide opening windows flush with the ceilings of those inverted bucket-like roofs so as to dislodge the vitiated air that lurks so much there.

At the very time when a general desire is expressed to educate the mind by works of art in our streets, it is curious to see the bust of George Heriot taken from the old High School yards in Edinburgh and placed in a chimney-pot fashion* on the gable apex of a new school in a recently-built locality. Such is a poor lesson, indeed, from the governors of the richest scholastic institution in Scotland; and then we have the ostentatious Free Kirk Normal School, located in Moray House, Canongate, disregarding the Architectural Associations of 250 years ago, that surround them; for, like Vandals, they have ruthlessly rough-cast over and coated with lime-wash the fine carved scrollwork on the stone lintels, that ought to have been cleaned and tricked out as lessons for this imitative age of masonry.

J. K.

FROM AUSTRALIA.

Melbourne.—The *Illustrated Australian News* of June 14 gives illustrations and descriptions of improvements in progress in Melbourne, including the new Art Gallery just opened.——According to the *Melbourne Age*, a substantial addition to the first-class business premises in Melbourne has just been completed in Collins-street West, for the firm of Edward Cohen & Co., auctioneers. The roof over the upper story is constructed on semicircular iron principals; and there being skylights in the roof, not only is this floor well lighted, but also the lower room and offices through the well-opening in the upper floor. The whole of the premises, with the exception of the front offices, has been re-built under the superintendence of Mr. Charles Webb, architect, by Mr. Cunningham, the contractor, at a cost of 6,000*l*.——The tender for the construction of the eleven miles of railway from Tarrawingee to Beechworth is at a lower sum than was expected, the exact amount being 70,108*l*., although the opinion of most experts was that the line would cost at least 100,000*l*.——The foundation stone of the Toorak Presbyterian Church was laid on May 24, in the presence of a considerable number of people. Messrs. Reed & Barnes are the architects for the building, and the style is Early English, cruciform in plan, the nave being 72 ft. by 28 ft., and the side aisles 60 ft. wide, divided from the nave by piers, columns and arches. Accommodation is to be provided for 450 persons, and the total estimated cost is 5,500*l*. The portion now being built is the nave and side aisles as far as the transept. The tower will not at present be carried higher than the first story, 32 ft. This portion will afford sitting accommodation for 250 persons. The contract for these works has been taken by Mr. James Bonham for 2,648*l*.——The sale of Crown lands has been resumed. The lots north of the cemetery realised higher prices than those obtained in Canning-street. The average price obtained for the lots at Carlton was 1*l*. 15s. per foot, the upset being 1*l*. per foot; the highest price obtained was 4*l*. 7s. 6d. per foot. The lots at Coburg, offered at 20*l*. per acre, realised 27*l*. and 29*l*. respectively. The amount obtained by the sale was 5,382*l*. 6s.

* It may surprise your readers to know, even in these days of Orientations and symbolisms in architecture, that on the east gable of the *quoad sacra* Kirk of Ladhope, Galashiels, there is a massive sculptured cross which is actually a chimney!

Books Received.

Practical Geometry and Engineering Drawing. By G. Sydenham Clarke, Lieut. R.E. Spon & Co.

Lieut. Clarke is instructor in geometrical drawing at Cooper's-hill College, and a few words from his preface will best explain the origin as well as the plan of his book. In dealing with large numbers of students, the writer felt the want of "a text-book which explained first principles fully and systematically, which preserved a clear and logical sequence throughout its pages, and which furnished examples bearing directly on the subject-matter of each chapter. Existing works did not satisfactorily meet the case. Some supposed the student to know too much, others gave him credit for knowing nothing. . . . . The objects of the writer have been to bring general principles into prominence, to illustrate those principles by a variety of problems fully explained, pointing out at the same time any peculiarities worthy of remark; and finally, to append to each chapter a number of problems, with occasional hints as to their solution." The plan thus sketched out is systematically adhered to, each chapter in the section on solid geometry starting from principles and definitions, going through explanations in detail, and concluding with examples. Two chapters on the methods of execution of engineering drawings, and the selection and use of drawing instruments, furnish the student with common-sense practical hints on subjects which, though secondary, are not unimportant in regard to rendering drawings clear, neat, and intelligible. Here, also, Lieut. Clarke teaches by example:—"Care has been bestowed on the plates, that they may be as far as possible examples of drawing, and not mere Euclid figures. By a strange irony, illustrations to works of the kind are too often more fitted to serve as warnings than as guides to the student. The two elements of success in draughtsmanship are sound theory and continued practice. No text-book can supply the place of the latter; but due attention to written instructions will at least save time—and paper." In another respect the volume is a protest in favour of care in details, for it is one of the most clearly and cleanly printed instruction-books we remember to have seen; everything is properly grouped in regard to type, and the fine paper and wide margin give quite an *air de luxe* to this engineering lesson-book, which certainly will not, on that account, be either less attractive or less useful to the students for whom it is intended.

The Mechanic's Guide: a Practical Hand-book for the Use of Engineers, Mechanics, Artisans, &c. By W. V. Shelton. Charles Griffin & Co.

The compiler of this treatise, who is foreman of the Imperial Ottoman gun-factories at Constantinople, states as his object "the gathering into one connected *whole* the principal subjects relating to various branches of the mechanical art, and placing before readers who may not have much leisure for study a concise and simple explanation of general principles, together with illustrations of their adaptation to practical purposes. . . . The book is the work of a practical mechanic, who may not have the language of a professor at command, but who has tried, to the best of his ability, to supply, honestly and thoroughly, information such as he knows to be greatly needed by intelligent mechanics at the present day." The book is, in fact, intended to be to the working mechanic what Molesworth's and other pocket-books are to the engineer and architect. It is a book of reference giving arithmetical formulæ and practical instructions for the carrying out of a great many problems in mechanical work, especially in regard to the setting out and proportioning of parts of machinery. Numerous tables, of the weights and specific gravities of materials, the circumference and areas of circles, &c., are added in an appendix; and the volume appears to be the result of considerable thought and care, as well as practical experience. Short treatises on arithmetic, practical geometry, and mensuration, precede the experimental chapters. The book ought to be of much use to artisans, but in some respects will hardly be actually made as useful as it might be, for we suspect few of those for whom it is intended will take the trouble, for instance, to go so much into the theory of such an operation as setting out the spurs of a wheel, as the author does. The theory is interesting as a matter of investigation, but in practice there is so much room for getting over an inaccuracy of theory by adjustment, that experience is likely to be the guide with most men; and so in some other matters. The artisan who wishes to know the reason and philosophy of his operations, however, will find much instruction here given without pedantry or pretension; and there is a great deal of purely practical information, the value of which, in this comprehensive form, will be obvious to every one.

The Mechanic's Friend: a Collection of Receipts and Practical Suggestions, with numerous Diagrams and Woodcuts. Edited by W. E. Axon, M.R.S.L., F.S.S. Trübner & Co.

This is a small volume giving practical illustrations in a great variety of mechanical problems, large and small, rather for the information of amateurs in mechanics than of the regular workman. The variety of subjects dealt with is very great, and the book is so far different from a number of popular handbooks of a similar kind, that it is not the work of a single, and perhaps not very "admirable" Crichton, but is a record of the experience of a number of persons, each in regard to the particular branch of work he has familiarised himself with. The substance of the volume has appeared in the *English Mechanic*, and the miscellaneous articles of which it is composed have been collected and edited by Mr. Axon. There is a considerable fund of information in the book, some of it useful and suggestive, nearly all of it interesting, in one way or another.

Miscellanea.

Damage to an adjoining House.—The case Crickett *v.* Coleman tried at the Trowbridge County Court recently, and adjourned, has been decided as follows:—The defendant purchased a house in the Market-place, next door to that which the plaintiff owns, pulled it down, and rebuilt it; and in doing this the workmen damaged the adjoining house, for which the plaintiff claimed compensation. The defendant employed a contractor, and it was part of the contract that a parapet should be made projecting over the roof of the plaintiff's house. This was a trespass. So, too, originally, plaintiff's house was the taller, and had eaves projecting over the defendant's house; the defendant told his contractor, by the contract and the plans, to build up his house higher than the plaintiff's. To do this, the contractor was compelled to cut off the plaintiff's eaves, and consequently all through the winter the water entered at the top of the house and poured down the staircase, and did permanent damage to the house. For all acts of this kind ordered by the defendant, the judge (Caillard) held the defendant liable. The plaint averred also many other acts of a different character. The defendant had paid 5*l*. 10s. into court, not specifying under which particular head or heads of damage it was paid in. The judge decided that the payment into court did not estop the defendant for setting up the defence that he was not the person liable, and that the contractor ought to have been sued instead. For all acts, directly or indirectly ordered by the contractor, the defendant was held liable; and all his other defences in fact falling to the ground, the case ended in a verdict for the plaintiff for 21*l*., and costs.

Social Science Congress.—The following have consented to deliver addresses on the various classes of exhibits at the Exhibition of Sanitary and Educational Appliances, to be held in connexion with the forthcoming Social Science Congress at Brighton: 1. Warming, Ventilating, and Lighting,—Captain Douglas Galton, C.B., F.R.S.; 2. Domestic Appliances and Economic Apparatus,—Mrs. Amelia Lewis; 3. Sanitary Architecture and Appliances,—Mr. George Godwin, F.R.S.; 4. Sanitary Engineering and Methods of Disinfecting,—Mr. Baldwin Latham, C.E.; 5. Food and Clothing,—Dr. William Hardwicke; 6. School Furniture and Educational Apparatus,—Professor W. B. Hodgson, LL.D. The Mayor will preside at the opening of the Exhibition, and Sir J. Cordy Burrows will address the assemblage.

National Federation of Trades Unions.—The Trades Unions Parliamentary Committee have issued a manifesto to the officers and members of the trade societies of the United Kingdom as a preface to their proposed code of rules for the government of the federated trades.

Cesspools Advocated!—At a special meeting of the Rural Sanitary Authority, Beverley, on the 18th inst., under the presidency of Mr. Burton, J.P., the subject of the drainage of South Cave was taken into consideration. A report was received, from which it appeared that the chairman, the medical officer of health, the clerk, and the inspector of nuisances, along with some of the members of the parochial committee, had recently inspected the parish. They found that there was no public pump in the village, and that much inconvenience was caused to the inhabitants in consequence. Some of the houses had private pumps, and many of the inhabitants derived their water supply from the village beck, which was polluted by the drainage from a number of houses, including a slaughter-house. The parochial committee was of opinion that the best plan would be to cover up the main drain in the market-place, and cut off all communication from this and the private drains with the beck, and leave the occupiers of the houses on each side to make cesspools behind their premises. This they could do at a trifling cost compared with the plan proposed by Mr. Harrison. After a discussion it was agreed by the authority, that the Parochial Committee should have three months given them to complete such a system of drainage as they deemed most desirable.

Railways.—The Board of Trade has issued a summary of our railway returns for the last twenty years, showing the remarkable progress made in that time. In 1854 there were, in the United Kingdom, 8,053 miles of railway open for traffic, and at the end of 1874 there were 16,449 miles, or more than double the former number. The ordinary stock has only risen from 166,030,806*l.* in 1854 to 248,528,241*l.* in 1874, the increase of capital having been chiefly in that which has a fixed rate of interest. Thus the guaranteed and preferential stock has increased from 49,377,952*l.* in 1854 to 200,930,629*l.* in 1874, or fourfold. The receipts from traffic have arisen from 20,215,724*l.* in 1854 to 56,899,498*l.* in 1874, or, adding rents, tolls, navigation, &c., 59,255,715*l.* The working expenditure constituted but 47 per cent. on the receipts in 1860, and was the same in 1871; but prices have risen, and in 1872 the expenses reached 49 per cent.; in 1873, 53 per cent.; and in 1874 they were 55 per cent. Still, the net receipts, which were but 4·19 per cent. on the paid-up capital in 1860, reached 4·37 per cent. in 1874. The recent rise in prices has materially affected the cost of construction and working of railways. In the year 1874 the gross receipts of the railway companies of the United Kingdom amounted to nearly sixty millions sterling, and the net receipts exceeded half a million a week.

A Builder Committed for Stealing Materials.—Joseph Windred, a builder, of Hounslow, was charged on a summons at the Brentford Police-court on Saturday with stealing a bundle of slate battens, the property of Capt. F. Vansittart, of Montpelier-row, Twickenham. The defendant was employed to carry out certain alterations at some house in Montpelier-row, Twickenham, so far as the work and labour were concerned, the complainant finding all the materials. Amongst these were eight bundles of slate battens, supplied on the understanding that what was not required should be taken back and allowed for. A man named William Neighbour, who had been in the defendant's employ, stated that seven bundles only were used, and the other bundle was removed by order of Windred to his own premises at Hounslow, and converted into a hen-house by witness for the defendant's fowls. At the same time he removed 100 slates by order of defendant. For the defence it was stated that there was an agreement between the parties for the work to be done for the sum of 109*l.*, and that complainant still owed defendant a balance, and an unstamped document to that effect was produced, but it was not signed by either complainant or his wife. The justices committed the defendant for trial.

Opening of the Temperance Hall at Newbury.—This hall was formally opened on the 17th inst., amid much enthusiasm in the temperance circles. The building, which stands facing the south, in Northcroft-lane, was for many years used as the National schools for this borough, and latterly as the Gospel-hall; but, under the hands of Mr. James, builder, of Pound-street (with Mr. H. Flint, jun., as architect), its appearance has been entirely changed, and where once stood a dilapidated school-room is now erected a very substantial, as well as useful and ornamental, hall.

Fatal Walk through Plate Glass.—Mr. Edward Holmes Baldock, formerly M.P. for Shrewsbury, who died recently at his residence in Grosvenor-place, at the age of sixty-three, was the son of the late Mr. E. H. Baldock, by a daughter of the late Mr. Gorringe, and was born in the year 1812. A few weeks ago he went to Kensington Palace Gardens to inspect the residence of Alexander Collie, which was then open to the public previously to being put up for sale. Among other additions to one of the apartments was a conservatory, filled with superb exotics. Mr. Baldock, advancing to the door to examine them more nearly, walked through a large sheet of plate glass which filled the aperture, and of which, there being nothing to denote its existence, Mr. Baldock was of course unaware. The ill-fated gentleman severely lacerated one of his legs just above the knee, and, though the arteries escaped, it would seem the nerves and tendons were injured to an alarming extent. The best medical skill was speedily called in; but erysipelas set in, which could not be reduced, and death ensued. We know two or three houses where a similar accident may occur any day.

A Yorkshire Antiquary.—Mr. Robert Davies, an antiquary of local celebrity, died on Monday at York, at the age of eighty-two. The deceased gentleman was formerly a solicitor in York, and was town clerk from 1827 to the year 1848. After his retirement from business, in archæological research he spent a very large portion of his leisure time. In the muniment-room of the ancient Guildhall at York he might be found almost any day; and in this manner he made a special acquaintance with the modern history of the city, about which he possessed more knowledge than any living man. His whole time was given up to literature, and as a result he has left a number of interesting works behind him. The first of these, published in 1846 or 1847, may be said to be the "York Records," which consisted of a number of papers illustrative of the history of York in the fifteenth century, or the time of Richard III., derived from the records of the York Corporation. Then he issued the "Memoirs of the York Press," which consisted of a list of the works printed in York, and notices of their authors. This the public received so recently as 1868.

Strike of Bricklayers' Labourers.—A fortnight since the bricklayers employed in the erection of the new Chester Workhouse applied for an increase of wages from 34s. to 36s. per week, and last Saturday they were paid at the rate of 36s. per week. Since then they have been placed on the hour system, and will be paid at the rate of 8d. per hour. The bricklayers' labourers were getting at the same time 23s. per week, but as the bricklayers were put upon the hour system they asked to be treated similarly. This was agreed to, and they were offered at the rate of 5½d. per hour, which would bring their wages up to 23s. 10d. per week; but they refused to work under 5½d. per hour, which would bring their salary up to 25s. per week. This Mr. Tomlinson, the contractor, refused to agree to, as well as the second proposition of the men that they should work day-work at 24s. per week. The men have, as a consequence, struck, and the result is that the bricklayers are also out for want of labourers.

Bad Mortar.—A successful prosecution of a builder for *using bad mortar*. What next! says the *Sherborne Journal*. "Why everybody will be obliged to be honest. A pretty state of things this for a civilised society living in a land of liberty. By-and-by we shall hear of successful prosecutions of house-proprietors for taking extravagant rents for dwellings no better than pig-sties. In the case we refer to it was stated that the mortar contained 80 per cent. of loam (which is a term often applied to road dirt). The Stipendiary, a London magistrate, Mr. Ingham, saw the wall and ordered it to be pulled down in seven days. He did more by that decision than Government has done all this session in the way of sanitary reform." [It was time for some one to interfere, for half the suburbs of London are built with mortar with a very small element of lime in its composition.]

Sewage pumped into the Thames.—According to returns furnished by the engineers of the Metropolitan Board of Works, the average daily quantity of sewage pumped into the River Thames was 310,567 cubic mètres at Crossness and 347,079 cubic mètres at Barking, equivalent to about as many tons by weight.

The Laird Memorial.—The committee of the Laird Memorial Fund has now on view, at the Birkenhead School of Art, near the park entrance, a number of models sent in by artists in competition for selection for the intended bronze statue of the late Mr. John Laird, M.P., to be erected near Woodside Ferry. The models are in plaster, sixteen in number, one being a bust, and the others the full-length figure. In consequence of the whole of them having been designed from photographs, any person who was intimate with the personal appearance and *tout ensemble* of the late Mr. Laird will at once notice that none of the models now on view are all that could be desired. Two approach nearer to an ideal likeness than any of the others. The committee of selection met on Tuesday, to decide which of the models, if any, should be selected. We understand that the committee have received subscriptions amounting to nearly 2,500*l.*, and with that sum they ought to be able to place on the site selected a monument worthy of it.

Winter Gardens for Blackpool.—Negotiations have just been completed for the purchase of Bank Hey, the residence of Mr. W. H. Cocker, J.P., Blackpool, with the land adjoining it, as a site for winter gardens, the amount of purchase-money being 23,000*l.* The new company will have a registered capital of 50,000*l.* in 10,000 shares of 5*l.* each, and many applications for them have already been made, and the scheme is looked upon as a very good speculation. Bailey's hotel, which was recently suggested as a site for winter gardens, has been sold to a company in course of formation in Rochdale for 62,000*l.* The proposal to form the winter gardens on the site of the Lane Ends Hotel and Hygiene-terrace will now be abandoned.

Accidental Death of a Builder in the Farringdon-road.—Mr. Langham, deputy-coroner, held an inquest on the 20th inst. at St. Bartholomew's Hospital upon the body of Edward Rees, aged 32, a builder, of Fenwick-place, Clapham-rise. From the evidence it seemed that the unfortunate man was standing on the roof of a newly-erected goods warehouse in the Farringdon-road on the 19th inst., giving directions to some men about a pillar which was being hoisted. By some mischance the deceased let go his hold of the scaffolding and over-balanced, and pitched head foremost to the stones below, a distance of 48 ft., and was so dreadfully injured that he expired in three minutes. A verdict of "Accidental death" was returned.

Holy Trinity Church, Wimbledon Park. A Munich window, the gift of Madame Lind Goldschmidt, has just been placed in this church, in memory of the late Dr. Wilberforce, Bishop of Winchester. The subject chosen is the Transfiguration of our Lord on Mount Tabor, with Moses and Elias on either side. In the extreme lights are figures of St. Boniface and St. Swithin, while beneath is a representation of the late Bishop confirming children. Under the figure of the Saviour are the words,—"He that believeth on the Son hath everlasting life." The window was executed by Messrs. Mayer.

Threatened Stoppage in the Cabinet-making Trade.—The Manchester and Salford branch of the friendly society known as the Operative Cabinet and Chair Makers, Carvers, and Wood Turners of Great Britain and Ireland, has issued a notice to the employers demanding an advance of 2s. per week upon the present rate of wages. The employers deny that the operatives are underpaid in comparison with workmen in the building trades, and they assert that the cabinetmakers are in many respects better off than other workmen, their time being more certain and their work being less liable to be broken.

Munificence of the Mayor of Sheffield.—In addition to the Mayor of Sheffield's gifts of a park and almshouses to the town, it was announced at a meeting on the 18th inst. that Mr. Firth had promised to provide, at a probable cost of some 15,000*l.*, a building for the lectures and classes commenced there and elsewhere by the Universities. It is understood that Mr. Firth will also subscribe 1,000*l.* towards a scholarship fund if 9,000*l.* are raised by the town for this purpose.

The Clerkenwell Surveyor.—At the last meeting of the Clerkenwell Vestry, Mr. G. I. Cox, assistant surveyor, Vestry-hall, St. Luke's, was appointed, from nearly thirty candidates, to the office of surveyor of the parish, in the place of Mr. Sanders Beven, deceased.

British Association.—At the meeting now going on in Bristol, Mr. Leone Levi will lay before the Association the report of the committee formed to inquire into the "economic effects of combinations of labourers and capitalists, and on the law of economic science bearing on the principles on which such combinations are founded." The chairman of the committee is Lord Houghton. A conference was held between the leading parties from both employers and employed, and the report deals with all the questions then raised and discussed.

The Mayo Memorial.—The statue itself is 9 ft. in height, its weight three tons, and it is carved from a solid block of Sicilian marble. The Earl is represented clothed in his robes as Viceroy of India, the long robe or cloak falling from his shoulders in effective masses of drapery, giving great importance and grandeur to the work. The left hand rests on the hip, the right holding a scroll emblematical of the statesman. The *pose* of the statue is effective, and the likeness good. The sculptors are Messrs. W. & T. Wills, of London, and the cost is 800 guineas.

Sulphur in Gas.—The experiments which have been recently made at the joint expense of three of the principal gas companies of the metropolis, and conducted by Mr. Vernon Harcourt and Dr. Siemens, in order to ascertain the best means of eliminating sulphur impurities from gas, have failed to be immediately productive of any practical result, and have been discontinued. The experiments were estimated to cost between 500*l.* and 600*l.*, but they have exceeded 3,000*l.*

The Abingdon Surveyor's Salary.—At a meeting of the Town Council last week the town clerk read a letter from Mr. William Townsend, the surveyor, asking for an addition to his salary on account of the increase of his duties. After some discussion, it was agreed to increase Mr. Townsend's salary as surveyor from 40*l.* to 50*l.* per annum, payable quarterly, on the understanding that Mr. Townsend should be subject to three months' notice.

New Congregational Chapel at Weston-super-Mare.—The memorial stone of the new Congregational Chapel, Weston-super-Mare, was laid on the 18th inst. by Mr. T. Rowley Hill, M.P. for this city, in the presence of a large assembly. The chapel now in use in High-street, which accommodates 350, having been found entirely inadequate for the attendance, it was resolved to build the new chapel, which is to cost between 7,000*l.* and 8,000*l.*

A New Cattle Mart in Perth.—A magnificent auction mart, erected by Messrs. Fraser & Macdonald, has been opened in Perth. The market is the largest in this country, and is very complete in its arrangement,—including in the building a spacious hotel, lodgings for servants, house for shepherds' dogs, stabling for 40 horses, and market space for 15,000 sheep and 1,500 cattle. The sheep-pens cover three-quarters of an acre.

Tenders for Bricks.—The Brighton Watch Committee have received five tenders for the supply of bricks, and they have accepted the following, the contract to include cost of delivery at the Corporation stores:—Messrs. J. Brace & Co., Funtley Works, Hants, 200,000, at 3*l.* 6*s.* 6*d.* per 1,000; Messrs. J. & R. Norman, Chailey, 50,000, at 3*l.* 9*s.* per 1,000; and Mr. John Gravett, St. John's Potteries, 100,000, at 3*l.* 8*s.* 6*d.*,—approved.

Good Service Pensions.—Mr. Douglas Galton has retired from the appointment of Director of Public Works and Buildings with a pension of 1,000*l.* per annum. His salary was 1,500*l.* per annum. The office of Director is not to be filled up. Mr. R. Redgrave, R.A., retires from the office of Director to the Art-Division of the Education Department with a pension of 750*l.* a year.

Fenton Town Hall.—The *South London Press* states that the Urban (Staffordshire) Sanitary Board have awarded the premium offered by them for public competition to Mr. J. W. Stevens, of 6, Wigmore-road, Camberwell, having accepted his design for the new Town Hall, police-station, engine-house, &c., to be erected at Fenton, Staffordshire.

Mr. David Campbell, Master of the School of Art, Worcester, has been appointed Professional Assistant Examiner for Art at the Science and Art Department, South Kensington. His departure from Worcester will be much regretted.

Statue of Sumner.—The Committee of Design on the proposed statue of Sumner at Boston (U.S.) threw open on the 2nd inst. the twenty-six models sent them by artists in response to their invitation. The models comprise the works of Millmore, Ball, Wood, Miss Hosmer, and others, and many of them are meritorious works of art.

Signs of Danger.—On Saturday, last week, some alarm was caused in High-street, Birmingham, by the falling of a large sign from the front of the premises of the National Clothing Company. Fortunately no serious injuries were sustained by persons in the street, two ladies, however, who were passing having a very narrow escape.

The Burning of the Liverpool Landing Stage.—The action against the Liverpool Gas Company by the Mersey Dock Board for the loss by fire at the landing-stage in July last year, was opened on Thursday in last week, before Baron Huddleston. The claim is for 200,000*l.* The liability of the gas company has been established.

Danger of Wooden Eaves.—A large corn warehouse in Gloucester has been burned down with a loss, by fire and water, of 25,000*l.* The fire is attributed to sparks from the chimney of the engine-house igniting the dry wooden eaves of the warehouse, which smouldered for a time and then broke into flame.

The Widow of the late Mr. Burchett.—A memorial, powerfully signed, has been presented, soliciting the grant of a Civil List pension to the widow (second wife) of the late Mr. Richard Burchett, the Principal of the Art-training School at South Kensington.

Sandown (Isle of Wight).—A stained-glass window, the gift of the Imperial Crown Prince and Princess of Germany, has been placed in the parish church of Sandown, Isle of Wight, in commemoration of their visit last season. The subject is Moses lifting up the brazen serpent.

A Statue of William the Conqueror is to be erected at Falaise. This statue, the work of M. Rocher, was finished in 1851, but, owing to lack of funds, could not be put into position until the present time. It is spoken of as very fine, is over 24 ft. high, and weighs seven tons.

Campden.—A contract for the restoration of the church has been entered into, and the work commenced. But the funds at present subscribed will not admit of engagements for doing all that is required. Messrs. Patman & Fotheringham, of London, are the contractors.

Stainland Cross.—This ancient cross, the only one remaining in the Halifax parish in anything like its former state, is to be restored at the expense of a gentleman resident in the neighbourhood. Mr. W. S. Barber, architect, Halifax, has the direction of the works.

Opening of new Churches in Cleveland. Two new churches were opened on the 20th inst. in Cleveland.

Wotton.—The work of enlarging Wotton Church has been entrusted to Mr. B. Inkpen, of Abinger.

TENDERS

For repairs to eight houses, Bridge-road, Battersea. Mr. S. Hewitt, architect:—

Dawson	£413 16 0 !
Richards	340 0 0
Copping	320 0 0
Pearce	280 10 0
Parrett	250 0 0
Feltham	250 0 0
Baker	250 0 0
Garrod & Smith	249 0 0
Short	245 0 0
Linfield	240 0 0
Haye (too late)	232 7 6
Simons	227 10 0
Vincent	208 0 0
Becker	196 0 0
Britton	175 0 0
Banner	169 10 0
Farley	165 0 0 !

For part rebuilding No. 7, New Compton-street, Soho, for Trustees of the late Mr. W. G. Nixey. Mr. S. Hewitt, architect:—

Macey	£819 0 0 !
Titmas	634 10 0
Cooper	633 0 0
Foxley	628 0 0
Patman & Fotheringham	583 0 0 !

For chapel, school-room, and class-rooms, at Newton Moor, near Manchester. Mr. J. Wills, architect, who also supplied the quantities:—

Robinson & Sons	£2,455 0 0
Marsden	2,396 0 0
Storrs (accepted)	2,169 0 0

For a tower and spire to St. George's Church, Tufnell Park, N. Mr. George Truefitt, architect:—

Carter (accepted)	£2,500 0 0

For additions and repairs to 79, Hamilton-terrace. Mr. George Truefitt, architect:—

Carter	£670 0 0
Bird (accepted)	640 0 0

For the erection of vinegar works, Peckham, for Mr. Woodham. Mr. Arthur Kinder, architect. Quantities by the architect:—

White	£2,479 0 0 !
Bartlett	1,963 0 0
Timewell	1,688 0 0
Hart	1,677 0 0
Unwin	1,668 0 0
Riley (too late)	1,649 0 0
Dover, Son, & Co.	1,645 0 0
Dunkley	1,632 0 0
Kirk	1,599 0 0
Bysh	1,563 0 0
Cropper, Brothers	1,555 0 0
Thomas	1,530 0 0
Aitchison & Walker	1,485 0 0
Kellaway	1,420 0 0 !

	Iron Girders.	Iron Columns.
Lucy & Co.	.....	£57 13 0
Macnaught, Robertson, & Co.	£56 17 6	.....
Clay	59 0 0	48 0 0
Head, Williams, & Co.	53 5 0	48 5 0
Gardner & Co.	53 3 0	46 0 0

For repairing roads and laying surface drains for the Swindon New Town Local Board. Mr. W. H. Read, architect:—

Phillips (accepted)	£596 1 0

For two semi-detached cottages at Broome Sewage Farm, for the Old Swindon Local Board. Mr. W. H. Read, architect:—

Haynes	£369 10 0
Barrett	366 18 0
Wiltshire	363 0 0
Thomas	345 0 0
Kent (accepted)	326 0 0

For Board-room, offices, and manager's residence, in Bath-road, Swindon, for the Swindon Water Company (Limited). Mr. W. H. Read, architect:—

	With Cellar.	Without Cellar.
Haynes	£1,150 0 0	£1,115 0 0
Phillips	1,065 10 0	1,041 0 0
Barrett	1,063 18 0	1,021 18 0
Wiltshire (accepted)	1,049 0 0	1,030 0 0
Forshaw	1,043 0 0	1,023 0 0

For office fittings, 24, Cannon-street. Mr. Sextus Dyball, architect:—

Lascelles (accepted)	£1,186 0 0

For a dwelling-house at Upper Tooting Park, Surrey. Messrs. Wadmore & Baker, architects. Quantities supplied:—

Scrivener & White	£2,700 0 0
W. & F. Croaker	2,645 0 0
Colls & Sons	2,593 0 0
Downs & Co.	2,520 0 0
Bowyer & Sons	2,374 0 0
Messom	2,132 0 0
Wagner	2,093 0 0
Smith	1,997 0 0
Mitchell (accepted)	1,987 0 0

TO CORRESPONDENTS.

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The Builder.

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ILLUSTRATIONS.

The Evangelical Church "De l'Étoile," Paris (Plan, 796).—M. Hansen, Architect 798
The Church of Notre Dame, at Hal. A.D. 1341 to 1409 799

CONTENTS.

The Company of Stationers 787
The Channel Tunnel: Position of the Enterprise 788
The Masonic Fraternity in the Old World and the New 789
The Excursion of the Architectural Association to the Neighbourhood of Angoulême 790
Old Brompton 791
The Threatened Destruction of Cæsar's Camp, Wimbledon 791
New Buildings for Poor-law Administration 792
Kirkcaldy Fine Art Association 792
The Assessment of St. Thomas's Hospital 792
Accidents 792
Water-tight Ponds 792
Competitions 792
St. Sepulchre's Church 792
Proposed Widening of Goswell-road 792
Tewkesbury Abbey Church 793
Transported Bridges 794
Acts for Spending Money 794
Ensemble 795
The Anglican Church in Zanzibar 795
Death of Mr. H. H. Vale, F.R.I.B.A., of Liverpool 795
Evangelical Church de l'Etoile, Paris 796
The German Sanitary Congress 796
Notre Dame at Hal 801
The Discoveries at Cleeve Abbey: Somersetshire Archæological Society 801
Castleford and Whitwood Main Drainage Competition 801
The Whitelaw Testimonial Fountain at Coatbridge 801
Suggestions for the Better Construction of Dwelling-houses 802
A Process for Permanently Preserving Iron from Rust (or Oxidation) 802
The Yorkshire Archæological and Topographical Association at Beverley 802
The Water-supply of Old London: The Bayswater Conduit 802
The Tees Conservancy Works 803
St. Jude's Church, South Kensington 803
Extension of the Birmingham Exchange 803
A Pretty Sample of a Churchyard 803
New Jewish Synagogue, Brighton 803
Statue of the Conqueror at Falaise 803
The Guinness Testimonial 804
The New Forest 804
Carlisle and its Death-rate 804
A New Art Exhibition 804
Injurious Competitions 804
The Population of Tyndall's Buildings 804
Who looks after Bedford street? 804
Height of Rooms 804
Nightly Lodgings 805
Falsification of Accounts by a Builder's Foreman 805
Grinding Money Again 805
Lawsuit against a Surveyor for Trespass: Lipthat v. Nicholson 805
Various 805
Miscellanea 805

The Company of Stationers.

STRONG light is thrown upon the manners and customs of our forefathers by the history of the various London Companies, and doubtless much additional light might be obtained from the hidden archives of these ancient guilds. It is not, however, too much to say that the history of the Stationers' Company is of more interest to the literary world than that of all the other companies put together. It is not merely the history of an individual company, but the history of English literature for several centuries. The Registers, which happily were saved from destruction at the time of the Great Fire, are of inestimable value for the entries they contain of books and ballads, more especially those of the Elizabethan age. Thomas Warton, author of the "History of English Poetry," was the first to quote these Registers extensively, and Steevens, Malone, Douce, Chalmers, and Ritson used them with good effect in illustration of their various researches; but it was left to Mr. Payne Collier to extract such book entries as related to the drama and popular literature down to 1586, which he printed for the Shakspeare Society in 1848–49. It has long been felt by literary men that a more complete transcript of these priceless volumes was required, not merely for convenient use, but that what now exists only in perishable manuscript should be put into permanent print. Mr. Edward Arber, with enthusiastic energy, has set himself to supply this requirement, and he has privately printed for his subscribers the first volume of his "Transcript of the Registers for the years 1554–1596." He proposes to carry the work down to 1640, after which date the entries are more numerous and less interesting. After this preamble, we will set ourselves the task of tracing the early history of the only London company which is now entirely restricted to the members of its own craft. The Stationers' Company was incorporated by charter of Philip and Mary on the 4th of May, 1556, and on the 1st of February, 1560, was created by the Lord Mayor one of the liveried companies of the City, but its history dates much further back than the first of these years. The writers of court-hand and text letters, and limners or illuminators, are mentioned as early as the year 1357 as united in some way, and on the 12th of July, 1403 (4 Henry IV.), the reputable men of the craft of writers of text-letter, those commonly called "limners," and other good folks citizens of London, who were wont to bind and sell books, presented a petition to the mayor and aldermen. In this same year, apparently in answer to the petition, the Lord Mayor gave them authority to form themselves into a Guild or Fraternity, which there is every reason to believe was the precursor of the craft of stationers. When the successors of Caxton began to multiply, they felt the necessity of being united as a guild, but in place of forming one for printers alone, they joined themselves to the stationers, and so the old name has been continued to our own day to represent all the trades that go to the production of a book. The Stationers' Company appears early to have taken a good rank in the order of the London companies. In a document dated 1501–2 we find it numbered 53, or seventh in order of the companies without liveries, and in 1574, the fourteenth year of its existence as a livery company, it stood in the first class of the minor companies. An assessment was made in this latter year of the proportion of 400 men appointed to be sent to "the queen's majesty's ships." The twelve principal companies were to supply from fifteen to forty men each; then followed the Leathersellers with thirteen, and the Brewers with ten; after these the highest number was five, at which amount were assessed the Stationers, Dyers, Tallowchandlers, Cutlers, Pewterers, Sadlers, Cordwainers, and Coopers. The twenty-one other companies were all assessed for smaller numbers, some, such as the Curriers, Plumbers, Masons, Weavers, &c., supplying only one man each. In 1591 the City of London furnished six ships and one pinnace towards the fleet, under the command of Lord Thomas Howard, which cruised all the summer about the Azores. 7,500*l.* were required for this purpose, of which sum the twelve principal companies supplied 5,174*l.* After these the largest contributors were the Dyers, Brewers, Leathersellers, and Girdlers; then came the Stationers, Whitebakers, and Barber-surgeons, who were each assessed at 80*l.* The remaining thirty-six companies were set down for much smaller sums. In a list dated 1602–3, the Stationers are numbered 49; but their assessment is as high as any after the first twelve.

The first Master of the Stationers' Company was Thomas Dockwray, who was neither a printer nor a publisher, but a Notary Public and Proctor of the Court of Arches, and it is a noteworthy fact that the company, which has since stoutly resisted the intrusion of lay members, should have chosen a stranger for their first master. The Stationers qualified to vote for members of Parliament are only outnumbered by the Spectacle-makers, and of the present livery of 312, upwards of 300 are in the trade. Formerly the freedom of the company was obtained (1) by serving an apprenticeship of not less than seven years; (2) by patrimony, whereby any son born subsequently to his father's freedom could claim his own freedom by virtue of being freeborn without serving any apprenticeship; (3) by redemption or purchase. The members elected under this third head usually paid a largely-augmented fee, but the celebrated Sir Thomas Smith, one of these redemptioners, merely paid the usual fee of 3*s.* 4*d.* on the 23rd of April, 1571, and the Rev. Robert Crowley, the well-known printing clergyman, was admitted to the freedom on the 27th of September, 1579, and afterwards to the Livery, without the payment of any fee. At present no one is admitted to the freedom unless he is connected in some form with the production of books, or takes it up by patrimony. There was of old a class of "brothers" in which were incorporated Continental workmen, then technically known as "Strangers," and English workmen coming from "beyond the liberties of the City," who were called "Foreigners." Many of the exiled Dutch and Huguenot workmen appear to have been enrolled as brethren of the Company. These brethren were not entitled to bind apprentices, but they might teach and employ them on behalf of freemen.

The Stationers have not always been located in the immediate neighbourhood of Paternoster-row, and the present building in Stationers' Hall-court is the last of a series of halls used by the Company. In the early days of the Corporation, when it was only a craft, it possessed a hall in Milk-street, Cheapside, the street in which Sir Thomas More was born, "the brightest star that ever shone in that *via lactea*," says Fuller. In 1554, two years before the incorporation of the Company, the Brotherhood purchased by voluntary subscription their second hall in St. Paul's Churchyard, but they still retained possession of the house in Milk-street, and on the 26th of May, 1611, a "committee was appointed to contract for the sale of the lease of the hall in Milk-street." Nothing would appear to have come of this resolution, for Nichols, in his "Literary Anecdotes of the Eighteenth Century," writes:—"The Company still possess two houses in Wood-street and three in Friars-alley and Clement's-court, in Milk-street, built after the Fire of London on the site of their original Hall." St. Paul's Churchyard, in the middle of the sixteenth century, and for many years afterwards, was a quiet enclosed place like the closes we still see in the old-fashioned cathedral towns. It was probably very similar to the beautiful surroundings of Salisbury Cathedral, though certainly not quite so extensive. Old St. Paul's, with its noble spire, was not unlike the Wiltshire Cathedral, and the noble trees in the yard went to make the resemblance more near. The house which the Stationers purchased was on the south-west side of the churchyard, and was known as Peter's College, it having been originally a college for chantry priests belonging to St. Paul's. In 1549, William Seres printed at Peter's College before he moved to the sign of "The Hedgehog" close by, and during his occupancy six men were killed by the falling of earth upon them while engaged in digging a well in the garden. Seres was a benefactor to the Company, and probably had much to do with their movement to the college, which was rebuilt for them. In May, 1570, the Company paid 20*s.* 1*d.* "for the payvynge of the longe cawsey betwene Powles Church dore and the

Stacioners' Hall," containing 98 yards. After the Company left the building it was converted into the Feathers Tavern, and according to Nichols ("Lit. Anec.," iii., 554-5), "covered the spot now (1812) occupied by the garden of the deanery, and the small court in which, after the Fire of London, four houses were erected by Dean Sancroft for the use of the minor canons." St. Paul's Churchyard, before the Fire, was chiefly inhabited by booksellers, and therefore the Company of Stationers were amongst their own people. Several of the first editions of Shakspeare's poems and plays were published by different booksellers in this place, as "Venus and Adonis," and the "Rape of Lucrece," at the White Greyhound; the "Merry Wives of Windsor," at the Flower de Luce and Crown; the "Merchant of Venice," at the Green Dragon; "Richard II.," at the Fox; "Richard III.," at the Angel; "Troilus and Cressida," at the Spread Eagle; and "Lear," at the Red Bull. The churchyard, however, was not large enough to hold all the stationers, therefore they overflowed into Paternoster-row, where, besides makers of rosaries and pictures of saints, dealers in books established their stalls. According to Stow, the houses in this street were first built outside the wall of the churchyard, by Henry Walles, mayor in the year 1282. When the Stationers' Company purchased Abergavenny House, at the west end of Paternoster-row, and left St. Peter's College, they still kept in the immediate neighbourhood of their own members. On the 26th of May, 1611, a committee was "appointed to be overseers for the companye and directers of the buyldinge, alteracons, and reparacons of Bergavenny House." Stow describes the place in the following words:—"At the north end of Ave Mary-lane, is one great house builded of stone and timber, of old time pertaining to John Duke of Britaine, Earl of Richmond, as appeareth by the Records of Edward II. Since that it is called Pembrookes Inne, nere unto Ludgate, as belonging to the Erles of Pembroke in the times of Richard II. the 18 yeare, and of Henry VI. in the 14 yeare. It is now called Burgaveny House," and belonged to Henry Neville, sixth Lord Abergavenny, who died in 1587. The house was altered by the Company, and "a new faire frame of timber" was added to suit it to their purposes. This,—the third hall,—was destroyed in the Great Fire, and on its site the present hall was built in 1670; but the front that is now seen in Stationers' Hall-court was added by Robert Mylne in 1800.

We will now turn to the consideration of the Registers, the perusal of the pages of which will give us a lively idea of the enterprise of the early printers. It must often have struck those who have handled the massive old folios of a former age how great were the labour and risk undertaken by the Barkers, the Tottles, the Fields and the Days of the sixteenth century. These honoured names frequently occur in the Registers of the Stationers' Company, which contain a large mass of materials towards a history of bookselling in England. Mr. Arber has not been content to produce a mere transcript of the Registers, but has illustrated the main entries by the insertion of important documents; for instance, pages 41-42 being blank in the original, we find in place of white paper in the transcript a copy of Christopher Barker's Report on the Printing Patents of 1558-1582. Barker shows how his office of Queen's printer has been shorn of its chief emoluments, and gives some interesting particulars. He writes, "Proclamations come on the suddayne, and must be returned printed in hast: wherefore by breaking of greater worke I loose oftentimes more by one Proclamacon, than I gayne by sixe, before may serventes can comme in trayne of their worke agayne, and in many yeares there hapeneth not a proclamation of any benefit at all." He goes on to point out how large a sum was required to print the whole Bible, yet he "did [as some have termed it since] gyve a desperate adventure to imprint fower sundry impressions for all ages, wherin I employed to the value of three thousande pounde in the terme of one yere and an halfe or thereabouts, in which time if I had died, my wife and children had ben utterlie undone, and many of my frendes greatlie hindered by disbursing round sommes of money for me."

It would be difficult to over-estimate the value of the Registers, for not only are they the final authority in questions of dispute about books, but being the account-books of the Company, they also contain a large amount of information concerning prices and the manners and customs of our forefathers. We cannot attempt to analyse their contents, but we may point to some of the chief matters of interest.

1. As to their Illustration of Literature.—The present volume of the transcript stops at the year 1596, and does not therefore contain some of the most interesting entries concerning literary history. We find innumerable notices of old ballads, proclamations, almanacks, and such books as "An Abstracte of the Geneolege and Race of all the Kynges of *Englande from the Floude of Noe unto Brute*," "Ye Cosmographie of the Worste Parte of the Worlde," "The Natures and Properties of all Wynes yat are commonly used here in England." Mr. Arber proposes to show, when he has finished his great task,—"How far the Registers are deficient as a record of their total contemporaneous literature, and the why and wherefore thereof.* Who were the greatest publishers? Who were the greatest printers? What kind of books were generally issued by each publisher? The answers to these queries, with a list of works now apparently lost, will constitute the consummation of this inquiry." Sometimes we come upon an entry that throws some light upon the family life of the old stationers; for instance, two sons of two celebrated fathers,—both Royal printers, and both among the founders of the Company,—obtained their freedom, on the same day, the 18th of May, 1565, viz., John Cawood, the younger, and Reginald Wolfe, the younger.

2. Illustrations of the history of the Company. The receipts largely consist of fines for various offences, such as printing without a licence, and selling contrary to ordinances. The fee for admittance into the livery has gradually increased from 15s. in 1560 to 51*l.* 3s. in 1875. The payments show us how the Stationers fared at their dinners, what they had to eat and drink, and what they paid for each article. They paid 5s. to the cook and his man for dressing the dinner, and 2s. for a bushel and a half of roses, with pot flowers for the windows. On another occasion, the cook and his men received 5s. and the minstrels 12s. The Company required some building done for them occasionally, and the items of expense are all set down. In 1560, the carpenter and plasterer received each 1s. 2d. a day, and the labourer 6d. In 1570, the price of 100 tenpenny nails was 8d.; of 34 yards of wainscot, 3*l.* 8s.; of two wainscot doors, 36s.; and the charge for painting all the lower end of the hall with green, yellow, and red, was 2*l.* 5s. On the 10th of January, 1571, the Queen visited Sir Thomas Gresham, and the Company erected a scaffold on the occasion, which cost them 3*l.* 4s. 6d.

Thirdly, the registers contain matters connected with the general history of London, as the assessments to which we have already referred. Besides these, the companies had to procure soldiers and fit them out completely: thus, in 1560, the Stationers were ordered to send two men to the English army who were about to besiege the French troops in Leith. They paid 9s. 4d. for two jerkins, 4s. for "two caps and skulls," 12d. for a dagger, 12d. for a pound of powder, 29s. for two new guns, 2s. 8d. for a doublet of canvas, besides other items duly set forth. Mr. Arber wishes to place the men of business by the side of the men of action in public estimation, and to rank the Cawoods, the Days, the Denhams, and the Barkers with the Drakes, the Hawkinses, and the Frobishers. We are not prepared to follow him to this extent, but all lovers of books must cherish a kindly feeling for the men who at some risk to themselves placed the works of genius in such an imperishable form that they can be enjoyed by us in these latter days.

The world has outgrown the companies and guilds of the Middle Ages, but they did valuable work in their time, and mixed up with their private history are particulars which the world would not willingly let die.

Working Men's College, Blackfriars-road.—The ninth year of this college will begin on Monday, September 6. We are asked to mention that there are night schools for men and women, for the study of arithmetic, book-keeping, reading, Latin, algebra, drawing, history and geography, French, German, physical science, and English literature.

* This question is partly answered by the fact that in early times all books of importance were protected by a special privilege which exempted them from the jurisdiction of the Company

THE CHANNEL TUNNEL: POSITION OF THE ENTERPRISE.

At length this vast enterprise, which, if completed, will certainly confer upon the engineering genius of the nineteenth century a conspicuous fame, has a chance of triumph over all the obstacles that have been predicted. The latest measures in connexion with the project have been of the utmost importance. A Bill has passed the two Houses of Parliament, authorising the acquisition of certain lands in the parish of St. Margaret-at-Cliffe, in the county of Kent; and, at the same time, the French Assembly, before its dispersion, gave at least nominal effect to a scheme for opening similar works on the opposite shore of the British Channel at Sangatte. Neither in the English nor in the French Reports or Bills is there found a full explanation of the plans, as they lie now, in manuscript, at the Board of Trade; but an examination of the documents, or the raw official materials of which they are composed, suffices to inform us as to the actual state of the question. It is simply this:—In the year 1862 a company was incorporated to construct an underground, and also submarine, tunnel between England and France, with all necessary approaches, accessories, and conveniences, so as to afford the means of perfect land communication between the two countries, and the powers it proposed to claim were legally justified. It would be superfluous to enter upon the legislative wranglings over plans, Acts to be abolished or construed, purchases, and costs, since the principal importance of the subject to the public consists in the mighty mechanical work to be undertaken. This will not be, at the outset, it may be as well to explain, an attempt directly to tunnel beneath the Channel for a railway line. It is only contemplated, according to the last statements deposited at the Board of Trade, to examine into the probabilities, or possibilities, of opening a way for the locomotive and the train at a safe depth below the sea. The present idea, then, is to sink, on both sides of the Channel, at particular points which are indicated, shafts through the grey chalk, or that which is almost nonporous and impermeable by water, and thence to conduct an excavation tending to meet from opposite ends, which should equal,—as it would, if triumphant, more than equal,—the perforation of Mont Cenis. However, the lawyer's aspects of the question are, at this stage, of little importance; the two Governments are agreed, and the thing has now only to be done. But what millions have been sunk in an effort to cross the British Channel, and conquer that "thin streak of sea-sickness" which, as popular tradition still asserts, frightened the famous Boulogne flotilla! Leaving out of consideration four of the Channel ports,—Hamburg, Rotterdam, Antwerp, and Ostend, as well as Havre and Dieppe, upon which this achievement, by the way, would not inflict any great injury, because they are commercial, rather than passenger, ports,—it is the narrowest sea which is the most formidable, which is, indeed, the "moat" of the Continent. The sufferers who, in default of a subway or drawbridge, endured the tortures of this brief passage, amounted last year to nearly half a million, and no number of *Castalias* or *Bessemers*, no matter how scientifically built, can meet the demand for those who feel an ineradicable hatred of salt and swelling water. There are excellent steamers, no doubt, employed upon the Channel service already, but where and what are the harbours? It is not the mere Channel passenger who finds himself inconvenienced. The invalid from Australia, or India, often declares that this bit of chopping sea-current is the most trying part of his voyage. He hates it worse than the rollers of the Atlantic, or the sultry nights of the Red Sea. Thus affirms, at any rate, Captain Tyler, whose report is in course of preparation for the next session of Parliament. His estimates concerning this little water journey between France and England are of peculiar interest. There is an average, he says, in the course of the year, of thirty storms; of 100 days bringing with them heavy seas and troublesome breezes; of 108 moderate days happening in succession; and 90 of cold weather. The two opposite coasts, so to speak, are hostile in character,—what with their cliffs, bars, sands, necessity for breakwaters, masonry piers, curves, capes, and shallows; and the problem has been, for many years, how to avoid the dilemma so long felt. Calais is, undoubtedly, so to speak, the English harbour of France. It

may be, geographically, a little less direct on the road to Paris than Boulogne; but it has been selected, whether for one reason or another, as the great centre of communication, by way of Brussels and Cologne, for Strasburg, the Rhine, the North of Europe, and North and South Germany. There is nothing, therefore, to be wondered at in the circumstance that so constant desire should have existed, or so continuous an endeavour been made, to abridge and facilitate this traffic, which, it may be said without exaggeration, is vital to the common life of Europe.

In the first place, however, it was deemed necessary to ascertain the probability of successful excavation. Geologically, the bed, and, nautically, the depths, of the Channel, are well known; yet sufficient has been ascertained, in other respects, to induce an opinion that the experiments should be undertaken, not precisely at Calais, but at a point near Ambleteuse, near the familiar village of Andresselles, where the deepest water, near that coast, is to be found. Originally, as every one is aware, the project was regarded as an impossibility, and enormous steamers, or ferry-boats, were suggested, which would have involved a world of new piers, basins, and sluice-gates; indeed, the fluctuation of ideas upon the subject has been the chief cause of its being left so long to wither in the pigeon-holes of speculation. After the great ferry scheme had broken down, the designs of Mathieu, the French engineer, for a Channel tunnel were deliberately brought upon the carpet, but as deliberately brushed away; for they were lost, and have never been recovered. Gamond came next, with a series of geological demonstrations, which have sustained the criticisms of time and science, and, at his instance, a Commission was granted by the late Emperor of the French, "which," in the language of the report, "appears to have come to the conclusion that it was desirable to test his investigations by sinking shafts and driving short headings under the sea, at the joint expense of the two Governments." But this is a French rather than an English view of the matter. Another countryman of our own, Mr. Low, also laid a plan before the Emperor, in 1867, as Sir John Hawkshaw had done, with even more elaboration, in the previous year, and Mr. Remington in 1865,—and their rivals, whose names deserve to be noted, although their ideas cannot be here described at length, were,—MM. Franchot, Tessier, Favre, Mayer, Dunn, Austin, Sankey, Boutet, Hawkins Simpson, Boydon, and Brunlees. It is worth while to observe the list, because, if the work has not yet been accomplished, it has evidently not been for want of ingenuity and will. It has miscarried, however, to a certain extent, through the variety and contradiction of the schemes projected. Apparently, this difficulty has been overcome, and the resolve has been arrived at definitely to pierce the stiff grey chalk. Mr. Remington, as appears from the printed remarks forwarded by him to the Board of Trade, would have selected the line from Dungeness to Cape Grisnez, in order to avoid the chalk and the fissures which he dreads encountering in the bed of the Channel, and to work in the Wealden formation, which he believes would afford a greater chance of success. Such is the latest aspect of the matter, as presented to the Department at Whitehall. But the report does not stop short here. It recapitulates the dreams, as some of them may indeed be termed, of other adventurous engineers. There were two or three who proposed bridging the Channel, and one actually professed himself prepared to build a "marine viaduct" from Dover to Cape Grisnez, with iron girders propped on 190 towers, 500 ft. apart, and 500 ft. above the water, and he estimates the cost of such an edifice at simply 30,000,000*l.*! Again, there was, as already mentioned, Mr. Hawkins Simpson, with his submarine tunnel on a pneumatic system, called by him, however, the "Eolian" principle, for which he claims the merits of cheapness, expedition, superior ventilation, and easier utility. It is interesting to note the inexhaustibility of inventors in these respects. There is Mr. Alexander Vacherot, who has submitted to the Board of Trade a scheme which, we ought to say, he laid before the Emperor of the French in 1856, for "laying on the bed of the sea a tunnel made, or formed, so as to constitute, so to speak, a monolith." He would "construct it on the shore," and "complete it in sections, to be drawn down into their places when finished." The representative officer of the department dismisses most of these projects with a critical, yet downright, denial of their practicability, and his language may be worth quoting:—"Although it was desirable to advert to these various expedients, it is not necessary, in this place, to say more in regard to them, than that, while I am unable to convince myself of the feasibility of any bridge scheme, I conceive that it might be wise to test the practicability of a tunnel by means of preliminary driftways." This is precisely what it has been agreed, by both Governments, both Legislatures, and the united companies, shall be done. It is true that not far from forty years have elapsed since M. Thomé de Gamond first attempted to prove that a submarine thoroughfare, between the two countries, was possible; but gigantic advances have been made, during the interval, no less in opinion than in science and mechanics. No international fears are now created by the Mont Cenis excavation, or the Suez Canal. They are regarded, indeed, as treaties and pledges among the Powers of civilization. The shores of the Atlantic have been united by a cable; the barrier of the Alps has been virtually destroyed; and, with reference to the latest and, perhaps, grandest project, a careful geological survey has shown, at any rate, the possibility of cutting a tunnel through the narrowest, or almost the narrowest, part of what are sometimes designated as the Straits of Dover, a distance of twenty-two miles, or slightly more. Trial borings and soundings taken at different points by Sir John Hawkshaw and the late Mr. Brassey indicate a bed of chalk as the stratum through which, after leaving the coasts on either side, the perforation is to be made. Of course, on the freedom of this bed from accidental fissures, dislocations, and "faults," the success or failure of the vast experiment depends; but there is every reason for believing that it lies in a mass, continuous and compact, between, as it were, two impenetrable ramparts of clay. From the boring on the English coast, in St. Margaret's Bay, a great unbroken depth exists,—175 ft. of "upper" chalk, and 295 ft. of "lower" or grey, chalk which is occasionally confounded with the clay itself; while the workings on the French side, near Sangatte, show 270 ft. of the upper, and 480 ft. of the lower. Experimental shafts, on a narrow scale, resembling somewhat the borings for an artesian well, have been carried to a depth of 600 ft.; but these supplemental demonstrations, in point of fact, were superfluous, the main object being to ascertain the depth and nature of the Channel bottom, which, at its deepest, is 180 ft., and its average rather more than 100 ft. below the surface of the water. No sudden changes of profundity, and no reefs or banks, are discernible, to the knowledge of the most experienced men, and the bed of the "thin streak" is shown to be a gradual and almost equally rising and falling concavity between the two coasts. Under these conditions, as the reports inform us, and taking into account the deep homogeneous strata to be bored—about 500 ft. thick—not less anywhere than 200 ft. between the crown of the arch and the bed of the Channel (allowing for the precipitous cliffs on either side)—every hope may be entertained that the enterprise, though so incomparably superior in its magnitude to that of Isambard Brunel for constructing a Thames subway, will be successful. The Thames Tunnel was, indeed, in some respects, a more hazardous enterprise. Little was then known about sub-aqueous boring; the materials were more shifting than those which the Channel excavators will have to encounter,—irregular strata of loose earth, masses of sand, gravel, mud, and clay, liable to constant disturbance; and a formidable tidal action. In remembrance of these obstacles, it was thought that a tunnel beneath the sea must present insuperable difficulties. But we have gone through the great submarine galleries of the Cornish, Cumberland, and other mines, and observed no more drip than would be evident in any cavern of the Derbyshire Peak. For instance, the mine of Shiel Lode runs to a length of 80 fathoms below the level of the sea, at a depth of less than 18 ft. from the water. It has never been inundated, nor have the workmen (workwomen also, we are sorry to add) suffered through deficiency of ventilation, space, and provisions for their comfort. To conclude, practically, however, the first boring is to be about 9 ft. each way, which dimensions are asserted are the least that can be depended upon as a test, or even as an experiment. Then will follow the work of enlargement, along the walls and roof, through the agency of a machine which, it is affirmed, can bore chalk at the rate of a yard, or more, an hour. A difficulty, however, may still have to be met. The most costly labour of any will be the removal of the excavated stone, clay, and soil. Tunnels driven underground have usually shafts, at intervals, through which the disturbed earth is raised, and their frequency, by enabling the excavation to be broken up into short lengths, reduces considerably the arduousness of the work. Such advantages, however, will not exist in the case of the projected Channel Tunnel. All the earth, or rock, or clay, or chalk will have to be removed to the terminal shafts at either end, and this toil and expenditure must increase as, by progression of industry, the headings are removed to greater distances from the ends. Nevertheless, the task is now fairly in hand, and we may rely upon the spirit and the genius of the age in which we live to carry it through effectually.

THE MASONIC FRATERNITY IN THE OLD WORLD AND THE NEW.

IN writing of an order which claims an existence away down the centuries further back than even the building of King Solomon's Temple, whose badge is more ancient than the Golden Fleece or the Star and Garter, whose secret mission covers the world, and whose principles embrace mankind, we beg to premise that it is not our object to seek to advise any non-Mason to embrace the "Science of Symbols," nor, we need hardly add, is it our remotest intention to reveal any of the secrets of the craft. We have a different purpose, as the reader will presently see. Both in the old and the new world certain events have taken place of late that have done more to bring Freemasonry before the eyes of the world, and to prove its power and popularity, than anything in its history has ever done before. To begin with our own country. The vast gathering of the brethren in the Royal Albert Hall, and the gorgeous and solemn ceremonial when the Prince of Wales was made the head of the order, will be long remembered by the Masonic brotherhood of the United Kingdom. The fact also that two more royal princes have likewise become brothers of the mystic tie,—the Duke of Edinburgh and Prince Leopold,—has contributed not a little to give additional strength and popularity to the craft. Nor must we overlook the recent presentation by the Baroness Burdett-Coutts of official chairs to the master and wardens of the Lodge which bears her honoured name,—in itself an incident in the history of Freemasonry which, bearing in mind the character of the donor, ought, one would think, to make the craft find greater favour in the eyes of some ladies,—particularly married ladies,—than by all accounts it does. The benevolent baroness is not, however, the only lady who has practically and substantially shown sympathy with the order and its objects. On the occasion of the dedication of the new grand Masonic temple in New York the other day, a number of the fair sex of that city presented the Grand Lodge with a beautiful banner, and the Lodge acknowledged the gift by a special vote of thanks. Touching the dedication of this new temple, the New York journals agree that never in the history of the country or the craft has there assembled such a congregation as that which participated in the solemn and peculiar ceremonies observed on the occasion. From England and Canada, and from almost every State in the Union, came representatives of the order. Clad in various regalia, the majority in the garb of the master workman, and thousands in the attire of knights, who symbolically illustrate the chivalric achievements of ancient story, bearing mystic emblems, and laden intellectually with legends and lessons that unite the present with the dim and misty past, the vast procession marched through the streets of New York, and was regarded with an interest unparalleled by any other public demonstration. The very name of their order signifies that they are builders, and although the order has long ceased to be practical masons, consistency compels them to give heed to the architecture of their own buildings. Accordingly, the new temple, we are told, is the best specimen of good masonry that has ever been dedicated in America to the observance of the Masonic ritual. It combines the requisites of solidity and taste more perfectly than any other structure of the kind, is the costliest Masonic edifice in the United States, and no unworthy type of the social and moral fabric which the Freemasons claim to have constructed.

Among our American brethren Freemasonry is a much more extensive and flourishing institution than it is with us. In the United States alone there are no fewer than 8,069 lodges, with 524,649 members. In England, Scotland, and Ireland there are only 2,136 lodges, and 131,150 members, which membership, however, includes (under the registry of England) lodges in Australia, New Zealand, China, New South Wales, Spain, South Africa, Burmah, Jamaica Barbadoes, Demerara, Brazil, and other countries. It will be found that nearly all the greatest American citizens have been brothers of the mystic tie,—Franklin, Washington, Lafayette, Daniel Webster, Henry Clay, being among the number. Especially interesting is the connexion of Franklin and Washington with the craft. When only in his twenty-sixth year, in 1731, we find Franklin writing thus:—"There seems to me at present to be a great occasion for raising a united party of virtue, by forming the virtuous and good men of all nations into a regular body, to be governed by suitable, good, and wise rules, which good and wise men may be more unanimous in their obedience to than common people are to common laws. I at present think that whoever attempts this aright, and is well qualified, cannot fail of pleasing God, and meeting with success." Franklin was made senior warden of the Tun Lodge, Philadelphia, in the following year, and in 1834 provincial grand master of Massachusetts, master of all the Masons in Philadelphia. It is worthy of note that the first Masonic book published in America was printed this year by the great philosopher, then in a humble way of business in Philadelphia. It is a small quarto, a reprint of the English Constitutions of Masonry. A few copies still exist in antiquarian collections. Moreover, the first written warrant granted in America by provincial authority was to Franklin, and the oldest American Masonic letters that have been preserved were written by him. He afterwards became Provincial Grand Master of Pennsylvania, and he was honoured with the like rank by the Grand Lodge of England when he visited this country for the second time in 1754. During his residence in Paris as American Minister (1776-85) he became affiliated, either as a special or honorary member, with the Grand Orient of France, and was presented by his French brethren with a medal, bearing on the obverse a fine bust of Franklin. Reverse, Masonic emblems, the serpent's ring, carpenter's square and compass; in the centre a triangle and the sacred name in Hebrew, &c. Legend—"Les. Mac. Fran. à Franklin, M. de la L—— des 9 Sœurs O. de Paris 5,778." The name of Washington is held in even greater esteem by his Masonic countrymen, who speak of him as "the great master workman," just as the nation at large speaks of him as the "father of his country." He early sought admission into the fraternity, and never lost an opportunity of advancing the interests or promoting the honour of the craft. While commander-in-chief of the American Revolutionary army, Washington countenanced the establishment and encouraged the labours of a travelling Lodge among the military, believing that it would be the means of checking the ferocity of soldiers, and alleviating the miseries of war. The Lodge was named Washington's War Lodge, Morristown, New Jersey, and it still flourishes. While his army was encamped here an interesting incident occurred which showed that the great General was true to his principles. A party of American troops was sent out on a foraging expedition. By and by, they encountered a number of British soldiers, who had been placed on guard over some baggage. A skirmish ensued, and the British were taken prisoners, and, with their baggage, carried to the American camp. On an examination of the baggage a Templar's sash and a Master's apron were discovered, and excited some surprise among the soldiers, who immediately took them to the tent of the Commander-in-chief. As soon as Washington's eyes fell upon the articles, he gave instructions that the baggage should be carefully protected from injury; that inquiries should be made after the owner of the Masonic articles, and if found that he be brought immediately to his tent. The owner soon made his appearance; kind words and friendly greetings attended his reception. He was treated with the greatest kindness while a prisoner, and shortly afterwards sent home to England on parole. This person was Sergeant Kelly, of the British army, who after his arrival home, lived to a good old age, and preserved the sash and apron with the greatest care. On his dying bed, Kelly exacted a promise from an old friend, a brother of the mystic tie, that he would forward, after his death, the sash and apron to Montgomery Lodge, New York, with a letter stating them to be a memento to the fraternity of the kindness and fraternal regard of George Washington toward a humble brother and a stranger. The relics were presented to the Lodge in 1838, where they are duly treasured with several other memorials of the Revolutionary war.

The oldest Masonic Lodge in the state of New Jersey, though not in America, is St. John, No. 1, Newark. It is fifteen years older than the Republic, and possesses a national interest from its relation with Washington, and his illustrious Franco-American compatriot General, the Marquis de Lafayette. The latter was initiated by the Fredericksburg Lodge in Virginia when he was only twenty years of age. He had just landed in the States to fight for the Republic. Three years afterwards he was made a Master Mason, Washington performing the ceremony. It took place at Morristown aforesaid, though the jewels used on the occasion were those belonging to St. John's Lodge. Some years ago the lodge-room was broken into, and all the jewels were carried off, including those used by General Washington. This Lodge boasts of having been the first organisation of any kind in America to celebrate the birthday of the father of his country, and it has done so ever since the year 1792, seven years prior to the death of their most illustrious brother. Remembering what he has done for the craft, as well as for his country, little wonder that American Masons should exult that the name of Washington stands enrolled in the list of brethren, and that they cherish the remembrance of his virtues and his services as a rich legacy for their emulous example.

A few figures will show at a glance the relative strength of Freemasonry in different countries in the Old and the New World. It may be stated that in England Freemasonry has from early times occupied a prominent position. As our readers are aware, the principal office-bearers at present are,—Grand Master, H. R. H. the Prince of Wales, K.G.; Deputy Grand Master, the Earl of Carnarvon; Senior Grand Warden, Lord Henry Phynne, M.P. The Grand Lodge of Scotland has for its Grand Master Sir. R. M. Shaw Stewart, bart.; Deputy Grand, the Earl of Roslyn. The Grand Master of Ireland is the Marquis of Abercorn; Deputy Grand, R. W. Shackleton; Senior Grand, Lord Viscount Powerscourt. The Grand Lodge of Prussia has for officers, His Imperial Majesty the Emperor William, Protector; the Crown Prince Frederick William, Deputy Protector. The following figures represent pretty closely the number of lodges and memberships in the countries mentioned:—

	Lodges.	Members.
United States	8,069	524,649
England	1,345	91,730
Prussia	309	35,193
Scotland	419	21,000
Ireland	372	18,000
Canada (Ontario)	323	14,530
Quebec	37	1,731
Italy, 65 Ldges., 151 Chaps.		12,050
France	266	10,800
Norway and Sweden	25	10,800
Spain	108	4,200
Portugal	57	2,800
Belgium	74	2,185
Nova Scotia	63	3,113
New Brunswick	30	2,038
Switzerland	28	1,800
Mexico	13	626
British Columbia	10	510

There are many places which eclipse some of the above, though we do not happen to have the returns of membership. Thus, South Africa is said to have 25 lodges; New South Wales, 31; Hungary, 33; New Zealand, 50; the Netherlands, 66; India, 63; Peru, 71; South Australia, Tasmania, and Victoria, 95; and Brazil, 104 lodges; while, according to a recently-printed statement, Arabia is said to contain 20,000, and Persia 50,000 Masonic brethren. When we add that a few months ago even his sable majesty, King Kalakana, the ruler of the Hawaiian Islands, was (having been duly vouched for), received as a brother Mason by the Grand Lodge of New York, enough has surely been said in support of the statement with which we started—that the secret mission of Freemasonry covers the world, and that its principles embrace mankind.

THE EXCURSION OF THE ARCHITECTURAL ASSOCIATION TO THE NEIGHBOURHOOD OF ANGOULÊME.

The sixth excursion of the Architectural Association has commenced, with favourable prospects, at Angoulême. Our readers will remember the very remarkable exhibition of the results of the 1874 excursion in the north of France, which were brought together at a meeting held in Willis's Rooms in December last, when Mr. Sharpe recounted to the Association in general, and to a large company of visitors, what the delegates of the Association had done in investigating the principal churches of the Transitional Period of architecture over a line extending from Laon to Chartres; and when by his own exertions, and those of various members of the party which had accompanied him, the walls were completely covered with a series of very effective and accurately executed detail drawings, obtained by enlarging a great number of carefully drawn and measured subjects selected from the sketch-books of the excursionists. On the present occasion, as on the former, the president of the Association and the secretaries accompany Mr. Sharpe, and as the number is necessarily more limited than an excursion party nearer home would be, every member understands that he must consider himself in a peculiar sense as a delegate, and that it is incumbent on the body in general to endeavour, by combination, to surpass the results obtained last year (valuable as those were), and that something should be produced of an intrinsic and exceptional value. Mr. Sharpe fully expects to do this, both on account of the peculiarity of the district now visited, and by the more systematic arrangement of the work to be distributed amongst his pupils—for such for the time being they are, and evidently do not wish to be thought anything else. The excursion, commencing Monday, August 30, will end on Saturday, September 11. During a similar period of last year materials were collected from which no less than eighty plates are to be engraved. It is true that last year there were sixty excursionists or more, and this year the number is limited to thirty. The latter number, however, includes most of the chief contributors to last year's work, and the losses may be said to be more than made up by fresh accessions. Some also who last year were young and inexperienced and comparatively ineffective, promise to be very useful. Another favourable circumstance is that the ground to be gone over is much less, so that probably at least one-half of the time taken up in moving from one place to another will be saved. Forty-two churches are to be visited, according to the list which has been given out. The district is almost unknown to the English artist and archæologist. Three of the churches, viz., Fleac, Roulet, and Angoulême, are slightly illustrated in the late Mr. Petit's work on French churches. The real discoverer of the architectural value of the district is Mr. Sharpe, who has been over the ground minutely with a view to this excursion.

The peculiarity of the architecture of these churches consists in their being derived from that very remarkable building, St. Front at Perigueux, a church which unhappily has suffered the very worst extremities at the hand of the modern French restorer. The peculiarity chiefly consists in the absence of aisles, and in the nave, choir, and transepts being vaulted by a series of domes, with a larger and loftier one at the crossing. St. Front itself was derived from St. Mark's, at Venice, and is only a very little later in date to that church. These churches in the Angoulême district are, again, a little later than St. Front, but amongst themselves nearly coeval, namely, of the twelfth century. Thus they form an exceedingly valuable step in the history of architecture, and it is hoped that the result of this excursion will be a complete illustration of this particular type. The time is very opportune, because many of the buildings to be visited are as yet untouched by the levelling hand of the French restorer. He is on the road, however, and has begun in bad earnest at Angoulême Cathedral, of which a large part has been pulled down, not from structural necessity, but to show how cleverly it can be built up again. We have had occasion sometimes in England to protest against a case of church restoration when it has seemed to be carried to an unnecessary extent, but even the least conservative of English restorers would hesitate to do what is done in almost every town in France. Let us hope that the influence of the excursionists, who are everywhere received with the

greatest courtesy, may be of some use in encouraging a healthier feeling amongst the French architects and clergy in this particular. Whether this result, however, can be obtained or not, it cannot but be of very great importance to English art that so considerable a number of students should be trained under such a director as Mr. Sharpe, and amongst such monuments as are presented by one of the most interesting districts of France. The first day's work, consisting of a round through Fleac, Linars, Trois Palis, Nersac, St. Michel, and back in the evening to Angoulême, has been duly followed out. Every one was ready for the early start at 6·30 a.m., and the hot sun,—for in this latitude the mid-day sun *is* hot,—did not hinder those whose duty it was to measure or sketch in the open air from doing their parts thoroughly. The description of the buildings visited may be properly reserved for a future opportunity; but it may be well to mention that two buildings in particular appeared to command the greatest admiration, namely, Trois Palis,—a small but interesting parish church, perfectly authentic and untouched,—in very bad repair it must be allowed, and one grieves to think what must soon happen; and St. Michel, a very remarkable octagon building, reminding one of the baptistery at Parma, with seven apsidal chapels and one wagon-vaulted entrance. This, however, has not the charm of complete authenticity, having recently been restored; still, the leading masses and some of the original detail remain, and it formed a very interesting *finale* to the day's work.

OLD BROMPTON.

IN our last gossip of Old Brompton, now South Kensington,* we spoke of standing by Methwold's Almshouses, and we would yet linger upon this spot for awhile to contemplate the extraordinary transformation. The parish boundary-post lay prostrate among the stumps of the old trees which, with the litter of boughs, bricks and mortar, and scaffold-boards, made a strange commingling when we viewed the site some time since; and one of the trees yet stands close by the newly-erected church which serves to identify the locality. In imagination we must remove the mansions of the Queen's-road, and reduce the breadth of it to the narrow lane, which at this point ran in a tolerably straight line till it terminated in the Gloucester-road, immediately opposite Victoria-grove. Underneath that group of lime-trees, at the corner of Cromwell-row, we trace its course past the pollard elms to the wicket-gate of Dunn's garden, where you might gather your strawberries for the small fee of sixpence. It was here, among the elms and the limes and the thick underwood, that the nightingale sweetly warbled in the soft spring night, and where, in the field adjacent, the wheat or barley was sprouting soon to assume its golden hue, with its garniture of poppies and field flowers. While contemplating the remarkable change the sounds of a piano fluctuated on the still air. Pleasantly enough fell ever and anon the strain, but it was not the melody we had heard there before. Even the Swedish nightingale, who often broke the stillness of Old Brompton with her charming notes, would admit that art can never rival even if it may approach nature.

But to resume our survey. Leaving the buildings of Hale House on the right, not forgetting the grass field, with the big walnut-tree, where the cows grazed, and passing up the shady Cromwell-row, we come to the five-barred gate, with the words, "No thoroughfare," and at the angle and junction with the Gloucester-road stood Gloucester Lodge. Built on the site of the Florida Tea-gardens for the Duchess of Gloucester, it was subsequently tenanted by the Princess Sophia, and afterwards by the Hon. George Canning, who was visited here by Queen Caroline. In the great statesman the Queen doubtless found an estimable adviser and an earnest friend. Sometime before 1851 the place had become deserted, and the groves tangled and neglected wildernesses. The house had the questionable character of being haunted, for the doors would slam of themselves, and the creaking of weird steps might be heard in the corridors by the affrighted nightwatchers. In fact, that active, restless, and malevolent spirit (dry-rot) had taken possession, as it does of many an old domicile, from one end to the other. The premises were pulled down in 1852. This residence, surrounded as it was by a thickly-wooded grove, formed a principal feature in the view of Old Brompton from the north-west. Standing on the slightly elevated ground at the corner of Victoria-grove, then (1850) but recently built, the range of panoramic view, backed by the undulating Surrey hills, formed a most agreeable picture.

The eye ranged from Brompton Church on the extreme left, to Colherne House at Earl's-court and the more distant towers of Walham-green Church; and Chelsea Church stood a little to the left of the centre of the picture, whilst all the middle distance was broken by occasional old buildings interspersed with foliage in the most picturesque manner, the russet and grey tones of the former mingling most harmoniously with every tint that may be found in the woodland.

But when twilight fell upon the scene and distance became increased by the "sinuous veil," the proximity to the town could scarcely be realised. It was lonely enough in the night season. We remember an anecdote related by an old gentleman who for some time was the private secretary of Mr. Wilberforce. Passing daily to and fro between Kensington-gore and Old Brompton he was sufficiently used to the loneliness of the Gore-lane to feel no alarm generally. From some circumstance or other which had recently taken place he felt unusually apprehensive, and on a dark and unfavourable night for the pedestrian carried home with him the cavalry sword which he occasionally used in his military exercises. The darkness of the night appeared to increase after leaving the old tenements at the Kensington end, and as he emerged into that portion of it which skirted the carpet-ground on one side and Mr. Kirke's nurseries on the other, he heard footsteps approaching him in the opposite direction; then as suddenly stop. Upon his halting the footsteps again approached, then again stopped, and so on, until, worked up to concert-pitch of alarm, he suddenly drew the sabre. This was enough; the "swish" from the steel scabbard solved the problem at once. A sudden rush through the hedge into the carpet-ground, and a scamper which seemed to mock pursuit, indicated that the alarm had been at least equally shared.

This Gore-lane entered the Old Brompton-road immediately opposite Thurloe-place, and all trace of it is now lost in the present Exhibition-road. Finding ourselves at this point, and close to the South Kensington Station, we pause to look at the rapidly-increasing mass of building on the site of Brompton Hall.

The enclosure at Onslow-gardens recalls something of the pleasantness of old, but in the extraordinary increase of the surrounding property we can scarcely identify the old sites. Yet in passing into Onslow-square we recognise some old friends in those elms of beautiful form and growth which still ornament its enclosure, and whose venerable appearance call to mind the time when Brompton had its Heath. In this enclosure we also find a portion of the fine avenue which formerly extended from the grounds of Cowper House to the Fulham-road, where it terminated opposite Hollis-place.

It was a few yards to the westward of this residence that a small row of houses were built about 1834–35, known as Sussex-terrace, and at this period it was considered a somewhat hazardous, if not doubtful, speculation, so little dreamt of was that change in the value of the land which ultimately turned the locality into a vast and populous suburb. At this period Bute House and grounds were in existence, where the aloe in blossom brought visitors from London, about the year 1838–9. The grounds adjoined those of Brompton Hall, and Bute-street arose on the site of this property. From the windows of the houses westward of this a very extensive view was obtained over Kensington, whose church might be seen in the rising grounds among the trees, after the eye had wandered over the rural little vale beneath. The Swan Tavern has but very recently disappeared, and its bowling-green and alcoves are now lost in the Queen's-road. It was opposite this tavern where we remember to have seen a little cottage at that time retaining the name of Heath Cottage. The old farmhouse, which at this point lay back from the road, and of which the aforesaid cottage formed a part and parcel, had been removed some years previously. The whole of this site has been converted into a handsome square, under the wand of Mr. Freake.

We pass on to that portion of the neighbourhood where the late Alfred Bunn received his dramatic guests, and where the "Swedish Nightingale" warbled her melodies, where the acacias and the willow overarched the road, at a time when Old Brompton might be fairly named as a secluded spot and the haunt of the Muses.

A little distance hence, and at the corner of the lane opposite Drayton-terrace, lived for some time William Jerdan, the editor of the *Literary Gazette*. In an old-fashioned house, overshadowed by a huge elm, the growth of two centuries, one of the most useful men at that time in connexion with the press, he carried on his literary labours. It was here that he first became acquainted with the fragmental poesy of "L. E. L.," then a young girl, whose genius was of too brilliant a nature to escape the vigilant eye of the painstaking editor, who first brought her verse into estimation through the medium of his journal. But at this date the Brompton-road was a purely country road, and remained so for many years subsequently. Less than forty years since the site of Drayton-terrace and Drayton-grove were unbuilt on. Thistle-grove terminated the building from the Fulham-road hither, and we remember an old friend who used to say that the adjacent field was never without a hare, and that he had often from his window in the morning counted six brace of partridges rise from "Boltons," now the site of scores of residences and St. Mary's Church. This site was not disturbed for building purposes until 1850–51, when the speculation was considered so uncertain in its results that some of the houses in Boltons were sold for 1,350*l.* each,—houses which have since brought 3,000*l.* apiece and more. Even at this time, however, that thick double edge which fenced in the market-grounds of the late Robert Gunter, Esq., remained undisturbed; and not till within the last five years or so had any change taken place, when lo! the wand of Midas touched the soil, and up rose mansions in the place of cabbages.

Even to Colherne House (the extent of our present ramble) has spread the great suburb; and where of old we have stood catching the southerly breeze as it swept over the meads, spreading out to Walham Green, we find fine houses, a couple of churches, and the busy population of a town.

* See p. 731, *ante*.

THE THREATENED DESTRUCTION OF CÆSAR'S CAMP, WIMBLEDON.

IT is to be feared that unless prompt and immediate action be taken, the injunction which was recently obtained on application to the Master of the Rolls to prevent building materials from being carted across a certain road on Wimbledon-common to the "Camp," will be practically unavailing. It appears that the parties who claim the right to build on the Camp have succeeded in getting the materials laid down on the spot by taking some other route, for it seems that at the present time building operations are actively in progress, the foundations of several houses having already been laid on the south side of the Camp, and the superstructures of the same have been commenced. In addition to this, steps are also being taken for building on the north side, workmen being employed in excavating the ground, and felling the trees, preparatory to the commencement of actual building. In order to save the Camp, as a part of the common, and which it is alleged has been illegally taken possession of, it is suggested that the same course should be adopted which was recently successfully pursued with reference to Epping Forest, but if any steps are to be taken, it is manifest that action must be prompt and immediate. The right of the persons claiming to build is decidedly questioned by those acquainted with the subject, and a meeting of the parishioners is contemplated. It is also stated that in case the parties claiming the right to build should establish such claim, the amount necessary to buy up such rights, and so preserve the camp, would be readily forthcoming, so anxious are the wealthy inhabitants of the district to secure the preservation of this historical spot. A very few weeks, or even days, must, however, determine the question whether the "Camp" is to remain, or to be a thing of the past.

The Ordnance Survey. — Major-General Cameron, R.E., C.B., has been appointed Director of the Ordnance Survey of Great Britain and Ireland. He has been for many years engaged on this important duty, and has honourably earned the respect and esteem of his colleagues and subordinates.

NEW BUILDINGS FOR POOR-LAW ADMINISTRATION.

Highgate.—Mr. H. Saxon Snell estimates the cost of the new infirmary at Highgate for the Holborn Union, and for which he has prepared the plans, at about 60*l.* per bed for 566 patients, equal to 33,960*l.*

Newington.—At the last meeting of the St. Saviour's (Southwark) Guardians, held on the 26th ult., the assistant clerk submitted plans which had been sent in by Mr. H. Jarvis, architect, showing the additions and alterations necessary at the Newington Workhouse, in order to meet the requirements of the Local Government Board with regard to the proper classification of the in-door paupers of the union. From these plans it appeared that the architect considers that the best course under the circumstances will be to run a corridor through the centre of the workhouse and the present board-room, and to erect wards at the front and back of the same. In this way the expense which would be entailed by the erection of an additional block to the present buildings would be saved. Mr. Jarvis also proposes to erect in front of the establishment, and *completely isolated from the workhouse*, a board-room, with waiting-room, committee-room, and office. As Mr. Jarvis was not in attendance, the Board deferred the consideration of the plans.

Lambeth.—The contract for the erection of the new Lambeth Workhouse Infirmary, to which we have referred in the last two numbers of the *Builder*, is at length settled. At the meeting of the Lambeth Guardians on the 25th ult., the committee appointed to inquire into the tenders for erecting the new infirmary and other buildings brought up a report recommending that, Mr. Tarrant having withdrawn, the tender of Mr. James Taylor, which was the next lowest, be accepted. The amounts of this tender were: 50,000*l.* for the new infirmary, 1,000*l.* for the out-door labour buildings, 2,600*l.* for the receiving wards, the total being 53,600*l.* The committee also recommended that Mr. Gladwell, who acted as clerk of the works for the present workhouse, when in course of erection three or four years ago from plans by Messrs Parris & Aldwinckle, be appointed clerk of works for the new infirmary, of which Mr. F. H. Fowler is the architect. The report was adopted.

KIRKCALDY FINE ART ASSOCIATION.

THE fourth annual exhibition of this association has just been opened, and promises to be even a greater success than last year's, while the quality of the works exhibited is better than ever. In all about 340 works are exhibited, among the most notable being those by W. Fettes Douglas, R.S.A.; J. C. Wintour, A.R.S.A.; Peter Macnab; C. E. Johnson; J. B. M'Donald, A.R.S.A.; John Smart, A.R.S.A.; Arthur Perigal, R.S.A.; H. M'Culloch, R.S.A.; James Cassie, A.R.S.A.; W. Beattie Brown, A.R.S.A.; Geo. Reid, A.R.S.A.; W. E. Lockhart, A.R.S.A.,; Kenneth Macleay, R.S.A.; Waller H. Paton, R.S.A.; R. T. Ross, R.S.A.; Clark Stanton, A.R.S.A; Sam Bough, R.S.A.; J. C. Noble; Geo. Aikman; C. N. Woolnoth, &c. In addition to this, the committee have been fortunate in procuring (on loan from Mr. J. Boyd Kinnear) two early examples of Sir David Wilkie. Local art is also well represented, especially in sculpture. The want of a proper exhibition-room is very much felt, and until it can be found the committee cannot possibly do full justice to the contributors or fully develop the usefulness of the association.

THE ASSESSMENT OF ST. THOMAS'S HOSPITAL.

THE Assessment Committee of the Lambeth Vestry have just reduced the assessment of St. Thomas's Hospital from 10,900*l.* to 7,000*l.*, being a reduction of 3,900*l.* The assessment has been reduced after the amount at which the hospital should be assessed had been settled in the Law Courts, and the reduction by the Assessment Committee has been the subject of a warm discussion in the Vestry. Several members contended that had good house property been erected on the site of the hospital, the amount of the rateable value would have been far in excess of what the hospital was rated at before this reduction took place, and Mr. Turner, one of the members, observed, that before the embankment was made, and any alteration took place, when the "old shanties" which the hospital had displaced were in existence, the place was rated to the parish at 8,000*l.* Mr. Akerman defended the action of the Assessment Committee, and stated that the number of the inhabitants of Lambeth who had received relief from the hospital in various ways, who would otherwise have had to be assisted by the parish, was very considerable. The vestry should bear in mind that there was a noble building at no cost to the parish; and although the assessment had been reduced, it was still rated at more than was the case when the old houses were in its place. He deprecated the notion of the vestry wishing to make a profit out of the hospital. Mr. Turner questioned the legality of the meeting of the Assessment Committee at which the reduction was agreed upon, and intimating his intention of causing another meeting to be called, to rescind the resolution of the previous meeting, but the clerk stated that the meeting was perfectly legal, and that the reduction must now be regarded as final.

ACCIDENTS.

AN *inquest was held on the 26th ult.* at the General Hospital, Birmingham, on the body of Isaac Wesbury, aged 31, painter, Vincent-place, Vincent-street. The deceased was engaged on the previous Monday afternoon painting a house in Sheep-street, when he fell off the ladder and fractured his skull. He was removed to the hospital, where he died in an hour after his admission. Verdict, "Accidental death."——On the 26th ult. a man named Richard Miles, employed by Mr. Avard, contractor, Maidstone, was severely injured by a circular-saw which he was attending.——A foreman mason in the employment of the Shotts Iron Company, named George Lamb, aged 39, has been instantly killed by a fall in the engine-house of the Shotts Iron Works, by which his skull was fractured.——A somewhat alarming scaffold accident occurred on Wednesday, the 25th ult., at Priestfield Colliery, Blantyre, occupied by W. S. Dixon (Limited), whereby four men,—namely, John M'Alpine and Robert Black, bricklayers, along with James Brown and Michael Cairns, sinkers, all of Blantyre,—were precipitated from a scaffold on which they were working in a new air-shaft to No. 5 pit, to the bottom, a distance of about 30 ft. M'Alpine got two of his ribs broken on the right side, and his right arm buised. Brown's right ankle and right arm were injured, and he was also slightly cut about the head. Black and Cairns' injuries were so slight that they were able to walk home. William Simkin, who was also on the scaffold when it gave way, managed to cling to the bell-rope, and thus escaped injury of any kind.——By the fall of a wall in Dunlop-street, Glasgow, on the 21st ult., a child, two years old, named John Kerr, was killed, and several persons were seriously injured. The accident is attributed to the pressure of a quantity of sand heaped up alongside the wall, and it seems that a load had just been emptied when the wall fell.

WATER-TIGHT PONDS.

FOR the information of your correspondent, "R. S. W." in your last issue, may I briefly describe how perfectly water-tight ponds are constructed in the China clay-works of Devon and Cornwall? The sides of the pond, or "*settling-pit*,"—usually round,—are built up with stone and *moss*, in short, are "dry walls," with the joints stopped with moss. The wall, as it rises, is "backed up" with 2 or 3 ft. of coarse *sand*, the bottom is treated similarly, and then the clay stream is turned in. Of course, there is leakage at first, but it *very soon ceases*; sufficient clay being carried back with the leaking water to form a natural and practically impervious cement with the sand. This is now the universal method adopted, with entirely satisfactory results, which have not been obtained where cement was used.

If "R. S. W." applied any modification of this plan he would find it successful. The settling-pits above referred to are equally tight with clear water, after they have been used for the clay a few times.

FELDSPAR.

THE writer of the question has not said what was the substratum to his concrete, nor how he allowed the concrete to dry. Perhaps too much lime was used in his concrete, which would allow the water to filter through it.

If clay, such as pottery is made of, is handy, he can coat the pond bottom 2 in. deep with it, or cement will be the only other remedy.

Allow me to remark that in forming ponds, clay will hold water, but sand, chalk, gravel, or peat require claying, even if concrete be used after as a top coat. Do not let the concrete dry by quick evaporation of moisture, or it becomes porous; but keep it wetted for a few days, to dry slowly throughout, and avoid anything breaking the set of the concrete, such as a plank end dropping on it, or it will be a leaky place.

J. CHARLES KING.

COMPETITIONS.

The Laird Memorial Statue.—We referred in last week's *Builder* (p. 785) to the models sent in in competition for the bronze statue of the late Mr. John Laird, M.P. We understand that the Committee of Selection have chosen the design of Mr. Albert Bruce Joy, of London, and that Mr. Joy has been entrusted with the execution of the work. There were seventeen designs submitted in competition. Mr. Joy was a pupil of Foley. *The statue will be 10 ft. high*, and will be placed on a pedestal 13 ft. high.

The Proposed New French Postage Stamp.—Four hundred and thirty-one designs for the new French postage stamp have been sent in. Of these, twenty-five were selected and reserved for final examination. The design which obtained the first prize of 1,500 francs represents Peace and Commerce leaning on a terrestrial globe with an equatorial band, whereon the words "République Française" appear. The second prize design represents Abundance supported by a shield. The third design shows France, as a nude figure, holding a flambeau to light the world. On all the prize drawings the words "République Française," and the price of the postage, are inscribed.

ST. SEPULCHRE'S CHURCH.

SIR,—Perusing the account of St. Sepulchre's Church and its restoration (by the architect) in your number of August 21, errors occur which I will endeavour to correct, and also supply a little additional information. To begin, the income of our esteemed vicar is put at 200*l.* per annum. This is not so; if it were, there is scarcely a parishioner who would not gladly contribute to supplement such a miserable pittance. With regard to the substitution of an oriel window for the niche and statue of Sir John Popham, it did not rest with the churchwardens alone: the entire restoration is entrusted to a committee of twelve, including those officers and the vicar. What the artistic merits of the statue that was to have vied with those already on the Viaduct might have been, it is impossible to say; but the window was the more costly, as the substitution caused an addition of some pounds to the contract.

Concerning the London and Middlesex Archæological Society, some of its members being also parishioners, they naturally felt interested in the interior restoration of their noble parish church. The Council paid a visit of several hours' duration, and afterwards, at their own expense, sent a report, accompanied by drawings, to the Restoration Committee, as a private and friendly communication. The remarks about their "orthodox functions and incapacity" are wholly uncalled for. I regret to add that, unknown to the vicar and senior churchwarden, an unfair use was subsequently made of the Society's report and drawings.

Few enter our church without admiring its fine, lofty interior. There is not the remotest intention of sacrificing it for Gothic. With the galleries removed, the useless lobby and St. Stephen's Chapel thrown in, we shall have no mean approach to the grandeur of a cathedral. The design for the tower and porch was (very unwisely) accepted by the Restoration Committee without competition. For the interior, three architects sent in designs. Those of an eminent firm have been selected, and from their large experience in building new churches and restoring old ones, a successful result may be anticipated.

As to the work just completed, though more ornamental, it is, in my opinion, less imposing than formerly, whilst the absence of string-courses in so lofty a tower, windows minus the usual sloping sills, the window-like clock canopy, and heavy tracery in the porch windows, are much to be regretted.

T. J. W.,
One of the Restoration Committee.

Proposed Widening of Goswell-road.—At a meeting of the Clerkenwell Vestry, on the 26th ult., Mr. Gillingwater suggested that, as a number of houses between Percival-street and Compton-street had been pulled down, to clear the site for the erection of large blocks of workmen's tenements by the Improved Industrial Dwellings Company, a good opportunity was offered to widen Goswell-road at that part. He hoped the vestry would put itself in communication with the Metropolitan Board, in order that the new buildings which are to be erected might be set back from the old line of frontage. He moved that the matter be referred to the Committee of Works. The motion was adopted.

TEWKESBURY ABBEY CHURCH.

Mr. Thomas Blashill, in his paper on Tewkesbury Abbey, read at the recent Congress of the British Archæological Association, said,—The history of this church, now nearly all that remains of a noble monastery, begins with the end of the eleventh century, or perhaps the commencement of the twelfth. For some 400 years before that time a small establishment of monks had existed here, at first as an independent foundation, but subsequently as a dependency of the Benedictine Monastery of Cranbourn. About the year 1084, Geraldus, the abbot of Cranbourn, came here and began the construction of a more important establishment, and three years later, in 1087, the Honour of Gloucester (of which the Lordship of Tewkesbury formed a part) having been given by William Rufus to Robert Fitz-Hamon, his relation in blood and by marriage, he appears to have at once promoted the idea of the abbot. Thus the monastery progressed until the church was completed, the chief bulk of which remains in its original condition to this day. A monk named Alfred was the "master of the works." If we may read this as "architect," it is an early and rare mention of such a person by name. In 1102 the monastic buildings were fit for occupation, and Tewkesbury became, instead of Cranbourn, the residence of the abbot and his monks,—they being fifty-seven in all, as given in the charter. In 1107, Robert Fitz-Hamon, the "second founder" of Tewkesbury, died, and was buried in the Chapter House, the church not being completed. Leaving daughters only, Mabel, the eldest, was married to Robert, a natural son of Henry I., who was created Earl of Gloucester, and is known in history as the champion of his half-sister, the Empress Maud, in her struggles against King Stephen of Blois. Earl Robert carried on the buildings, and the church was consecrated in 1123, being then probably completed except as to the tower, which would occupy a few years more. We may infer this much from the general severity of design throughout the church, the archaic character of such ornament as does exist, and the greater richness of the upper stages of the tower. A wooden spire, covered with lead, is said to have been built by Earl Robert before his death in 1147, but whether this was the one which fell on Easter Day, 1559, may be doubted. The church then comprised the nave and aisles, divided by tall and massive circular columns; over them was a very simple and insignificant range of coupled arches in place of the triforium usually adopted, and a clearstory, of which we can fairly estimate that it carried a wooden roof at the height of, perhaps, as much as 10 ft. above the soffit of the present vaulted ceiling. A similar arrangement to this was adopted at Pershore and at Gloucester, but here it is carried to an extreme, the height of these columns being 30 ft., which is 3 ft. more than those in the nave at Gloucester, the diameter of these being about 6 in. less. The original intention of the designer of the western façade is a puzzle which cannot easily be solved. The western façades of large churches of early date are, perhaps, their least satisfactory point. This is the first and almost the only case where an immense arch was formed so as to gain an importance which could not be otherwise obtained. It seems to have been actually filled in with a wall pierced with windows, but I cannot think this was the original idea. Such a wall set back for a few feet behind the arch, and a pair of western towers, of which the rudiments seem to exist here, would have produced a magnificent effect, as may be judged from the west fronts of Lincoln and Peterborough, where experiments of this kind were tried, but there is no evidence of the recessed wall in this case. The towers were not actually built, a mere turret being carried up over each of the side staircases,—the present terminations to them, including the highest window openings, being evidently a modern imitation of twelfth-century work. Dingley's sketch of the church shows the tops of these turrets crocketed like those on the angles of the central tower. There is a fine north porch corresponding in date with the church; by it the townsfolk had access to the nave, which was their parish church. It has a dark room over it accessible only from a narrow wall gallery. The stone seats in the porch are said to be, and probably are, portions of the ancient slab of the high altar, but no dedication crosses can be traced upon them. The aisles, like the nave, had wooden roofs, and not the half-barrel vault which has been inferred from the existence of the half-arches thrown across them to act as buttresses to the central tower. The transept was exceedingly severe in design. It had the usual apsidal chapels in its eastern face, and the church was completed to the east with a very short choir, or rather presbytery, consisting of only two arches beyond the tower, and an apse which is not semi-octagonal, as is usually said; but semi-hexagonal, an unusual but a more convenient form. Over the arches of the presbytery were the usual triforium and clearstory. An ambulatory was formed round the presbytery; it also may have been semi-hexagonal, and no doubt had three small apsidal chapels. From the floor of the church a fine view of the interior of the tower could be had, showing two tiers of arched openings and a tier of windows above them, throwing light down into the church. Traces of the twelfth-century monastic buildings of important size are found on the southern face of the church. In the south-eastern angle of the transept is the turret stair, by which for over 400 years the monks descended direct from their dormitory to the early morning services, their choir being between the two arms of the transept, and under the central tower. Such was the church as left by Earl Robert of Gloucester at his death in 1147. Earl William, his son, did nothing to it, for nothing needed to be done, so complete and solid was the work. In 1178 the monastic buildings were burnt, and traces of this fire are plainly visible on the adjoining walls of the church, but no remains that I have seen show the characteristic work of Henry II.'s reign, which would be the style of the new buildings if any were then erected. In 1183 Earl William died, and leaving no son, the husbands of two out of his three daughters were successively Earls of Gloucester. Our associate, Mr. Planché, Somerset Herald, has recently shown that the first of these was Prince John, who had married Isabella, and became King of England; then followed Almeric de Montford, the husband of Mabel, and Geoffrey Mandeville, the second husband of Isabella, after her divorce from King John. On the death of this last in 1216, Gilbert de Clare Earl of Hertford, the son of Earl William's other daughter Amice, became Earl of Gloucester.

According to Mr. Planché (see *British Archæological Association Journal*, 1870), the Clares would be Lords of Tewkesbury from 1216 for a period of ninety-eight years. They adopted this as their place of burial, and lie side by side between the two westernmost arches of the choir—the first Gilbert and his son Richard, then Gilbert the second (the Red Earl) and his son, Gilbert, the last Earl of Gloucester and Hertford, who at the age of twenty-three was killed while leading the fatal charge of the English horse at Bannockburn, in 1314. The work that required to be done here during the time of the Clares was not very considerable, but it was important, and we can see from its mutilated remains that it was carried out in the richest and most elegant manner of the thirteenth century, towards the middle of the reign of Henry III. I venture to think that the nature of the work then done has been misunderstood by all the historians of the abbey. The ancient Register, known as the "Annals of Tewkesbury," gives but a meagre account of the buildings executed. It records that in 1219 Abbot Peter built the dormitory and back offices, which work has been destroyed. Also, that in 1237 Prior Sipton rebuilt the chapel of St. Nicholas, and this is assumed to have been the work done on the site of the old apsidal chapel on the east side of the north transept. But the most important work of this period was a building which extended along the north face of the transept, and beyond it as far as the eastern face of the chapel last named. This building has been thought to be the two chapels of St. James (or of St. Nicholas) and of St. Eustache. It consisted, in fact, of a chapel to the east, approached through a large ante-chapel, the two forming a beautiful model of a small church, having a nave and chancel. I can find no reason for the dedication of such an important building to any of the saints to whom it has been ascribed, but I think that a close examination will clearly indicate the motive for building it, and the cause of its peculiar form. During the twelfth century, the interest of the laity in the public worship of the church had greatly increased, and the enthusiasm of both clergy and laity in honour of the Virgin Mary was vastly augmented. The small eastern lady chapels became inadequate to the increased demand for this means of worship. In those churches where the eastern termination was apsidal there was some difficulty in constructing a large lady chapel, and if the church was monastic the laity could not gain access to a lady chapel so placed without some interference with the portion of it kept apart for the use of the monks. Although these two objections were in several instances overcome, they are set forth very neatly in the case of Durham, where a chapel to Our Lady having been begun at the apsidal east end, the walls began to crack, from which it was inferred that St. Cuthbert objected to anything which would bring women so close to his shrine. The chapel, which is called the Galilee, was therefore built at the western end of the cathedral. The most convenient position for a chapel of Our Lady which might be used by the people was on the eastern side of the transept, farthest from the monastic buildings. So it was at Worksop Priory and at the Abbey of Bury St. Edmund. It could not be so placed at Tewkesbury without destroying a chapel already existing. If that had been possible, the transept would have formed the ante-chapel, or place for the people; but as it was necessary to place it beyond the transept, an ante-chapel had to be provided, and the result is the beautiful arrangement of which we now see the mutilated remains. The "Annals" record that in 1239 "the Church of Tewkesbury was dedicated, with the major altar, in honour of the glorious Virgin Mary." Perhaps we should understand by this, not that the Church with the high altar thereof was re-dedicated, for which no reason seems to have existed, but that the church, *with the major altar to the Virgin*, was dedicated. If so, that would clearly refer to this lady chapel, for (as was the case at Bury St. Edmund's) the old eastern lady chapel would also be retained for the use of the monks. We are greatly indebted to Messrs. Collins & Cullis, the contractors, who have very kindly made such excavations as were necessary to clear up doubtful points in this investigation, and to Mr. Collins for great personal trouble in the matter. I am much inclined to think that the Chapel of St. Eustatius, built by Prior Henry de Banbury, in 1246, was built between the eastern part of the new lady chapel and the north aisle of the choir, including the site of the old apsidal chapel. If so, it would be entered by the ancient archway of that chapel, now blocked up. In that case the chapel of St. Nicholas must have been one of the small chapels in the ambulatory of the choir. But so many changes have evidently taken place at that spot that further investigation is desirable.

This, then, was the condition of the church when the last male of the line of De Clare was buried here in 1314. Seven years afterwards his eldest sister, Eleanor, was married to Hugh le Despenser the younger, the favourite of Edward II., who was created Earl of Gloucester, and had the Tewkesbury lordship, and the patronage of the Abbey. The Despensers were here till 1414, a period of ninety-three years. In five years this Hugh was hanged at Hereford, with a wreath of nettles round his head, for his attachment to his sovereign. His body was dealt with in the extreme of the barbarous fashion of that age, such parts of it as could be collected being buried to the south of the high altar. I am hardly prepared to admit that the monument which exists there at the back of the sedilia is his memorial. His son, Hugh, Baron Despenser, died in 1449, and his widow (who was a Montacute) married Sir Guy de Brien. She and her first husband, Hugh Despenser, lie buried under the handsome monument to the north of the high altar, which is the first that can be identified of the series of grand historical memorials for which this church is famous. The monument facing this on the other side of the ambulatory is attributed to Sir Guy de Brien, who survived his wife for nearly thirty years, dying in 1490. The extensive works done to the church in the time of the Despensers are attributed to the three persons just named, especially the last. Sir Guy de Brien was a person of considerable position, having his own residence at Castle Welwyn, in Pembrokeshire, being a Knight of the Garter, and constantly engaged in the service of the sovereign. He was, as might be expected, one of the benefactors of the church, leaving to it some property at Bristol, for the support of certain of its services, but why he, whose connexion with Tewkesbury was so short, and, as it seems, so slight, should do so much for it, and should even be buried here, requires to be better explained. I can now only endeavour to elucidate the history of the works undertaken about this time, and as they present considerable

difficulties to the archæologist, careful attention to their details will be necessary. For some reason it was now determined to greatly increase the magnificence of the buildings and the number of altars in the ambulatory of the choir. The increasing wealth of the community, derived chiefly from the benefactions of the Lords of Tewkesbury, would sufficiently account for this, but I suspect that the building which I have called the new lady chapel had become dilapidated through failure of the foundation of the north wall of the transept. . . . . Of the monastic buildings the remains are slight; the great gateway is the most important, and it has been substantially repaired. The buildings adjoining it on both sides are of the latter period of Gothic architecture, and were connected with the business portion of the monastery rather than with the discipline of its inmates. We shall perhaps best conclude our inspection by lingering over the exquisite specimen of the latest phase of Gothic before its day of decline, which is seen in the north-eastern angle of the cloister, and which was thought worthy of being copied in the new Houses of Parliament, the most important modern attempt to emulate the glories of this past and once almost forgotten age. And yet we should not omit the opportunity afforded by the sight of the work now going on here of expressing our sense of the obligation which is owed by archæologists to those who are now so carefully and conscientiously carrying on the work, as well as our wishes that funds may be found for its completion in their own time, so that the grand old nave may be filled with the parishioners as of old, who will then see the ancient choir of the monks, and the further presbytery stretching far away in such a magnificent vista as few churches in England can show the like.

TRANSPORTED BRIDGES.

It may seem anomalous that bridges that are to do duty in various parts of the United Kingdom, and in the four quarters of the globe, for generations to come, should be erected first on the Isle of Dogs, on the banks of the Thames. Yet so it is. In the yard of Messrs. Westwood & Baillie, London-yard, Poplar, iron bridges have been erected that have been sent to Japan, India, La Plata, Trinidad, Mauritius, and various other countries, as many as 1,600 bridges having been thus fitted up for the Bombay, Baroda, and Central Indian Railway alone.

In the yard of this firm there is at present, quite near completion, the superstructure of a lattice girder bridge for the municipality of Calcutta, that is remarkable alike for its great strength, and for the excellence and precision of its workmanship. This bridge,—the Hastings-road,—is 174 ft. long, with a clear span of 162 ft. The lattice girders are 13 ft. deep. One pair of the diagonals, which are the same throughout, are of rolled iron bars 8 in. by 2½ in., the other pair are of bars 8 in. by 1 in.; the angle-iron bracing is 3 in., and 3 in., by ½ in. The flange of the main girders is 2 ft. 8 in. wide. The cross girders, which are 18 in. deep with 9 in. flanges, are placed at 4 ft. 4 in. between centres. They project on each outer side beyond the lattice girders 5 ft. 3 in., and 6 ft. 10 in. alternately. These projecting ends carry a footway floored with spaced planking 9 in. by 3 in. The footway is fenced by a handsome wrought-iron railing 3 ft. 8 in. high. At each alternate cross girder, with the extra projection, the railing is supported by an ornamental cast-iron standard, with a neat cap, that does duty as a sort of vertical bracket. There are about twelve tons of wrought iron in the hand-railing. The footways on each side are 5 ft. 4½ in. clear; the carriage-way, between the lattice girders, is 24 ft. 9 in. clear, and the clear headway under the three cross-ties at the top 18 ft. 6 in. The ties are a quarter-circle at the ends, and straight along the top; they are latticed along the straight part, and have plate webs at the ends, with flanges at top and bottom; they rise 3 ft. from the spring.

The roadway is formed of segmental plates, of $\frac{3}{16}$-in. iron, laid across the bridge, and riveted to the cross girders; they rise about 9 in. The haunches will be levelled up with concrete and covered with ballast. The brick piers will rest upon 6 ft. of masonry on a broad concrete foundation, and a thick cast-iron bed-plate. The bridge is designed to bear nearly three times the strain or load of a railway bridge.

On the next berth in the yard to that occupied by the Hastings-road Bridge is one of the spans of a bridge for a region that is to be soon one of the Prince of Wales's hunting-grounds. It is to cross the river Kalutura, in the island of Ceylon. It is a trussed girder, of twelve spans, 106 ft. each between centres longitudinally, and 21 ft. 10 in. between centres laterally. The girders are 11 ft. deep. The cross-girders are fish-bellied, 1 ft. 9 in. deep, and set at 5 ft. apart between centres. The web is of ¼-in iron, with top and bottom angle-irons, 3½ in. and 3½. in. by by ½ in. The girders are covered with corrugated ¼-in plates, laid longitudinally. Each plate goes over two cross-girders. These will also be levelled up with concrete and ballast. The bars of the principal girders are 12 in. by ⅝ in. The top and bottom plates are 20 in. wide, and trough-shaped, one plate at the ends, strengthened to three in the centre.

The bridge will rest upon cast-iron cylinders, to be filled with concrete. The cylinders are 6 ft. in diameter, and are cast in three segments. They will be joined vertically and horizontally by bolts through flanges. The piers formed by these cylinders will average about 50 ft. high. Ten thousand bolts will be used in fixing them, and about 16,000 tons of wrought and cast iron will be used in the entire bridge.

The Kalutura Viaduct will be used, in the first instance, as an ordinary roadway for carriages and horses, and, possibly, elephants and other animals, but in anticipation of its being on the line of a future extension of the railroad from Colombo, it has been designed to serve for railway traffic if required. The line is now only about twenty-five miles from the locality where the bridge is to be erected.

Another bridge in hand by this firm has not to be taken so far afield. It is for the Great Eastern Railway Company, to span the Ouse at St. Ives. Its principal feature is a bow-string girder 101 ft. long. It will have nineteen other spans of 30 ft. each. The wind-tie bracing in the principal span will all be of wrought iron. The cross-girders will be 6 ft. 8 in. apart, with rail-bearers between. The principal piers, of brick with stone caps, will be 6 ft. wide, the others about 3 ft. There will be about 400 tons of iron in the structure.

A characteristic of the bridges built by Messrs. Westwood & Baillie, it is not claimed to be a peculiarity, is that every one of the vast number of separate parts is an exact counterpart, in shape, bolt and rivet holes, and in every other respect of every other part of the same sort, the whole work being made and prepared by template.

ACTS FOR SPENDING MONEY.

Of the 257 Bills for which petitions were presented to Parliament in the recently-expired session, 189 have become Acts, exclusive of powers granted under confirmed provisional orders. Of these there are seventy-one Railway Acts, seven Tramways, thirteen for Gas and Water Supply, seventeen for Gas Supply, twenty-five for Water Supply, sixteen for Dock, Pier, and Harbour Works, eighteen for various purposes to Corporations and Local Boards, and twenty-two miscellaneous.

Among the most important railway Bills passed, in so far as extent of works and amount of additional capital to be raised are concerned, are the two Bills of the London and North-Western Company, for making fifty miles of new line, in various localities, and for raising 4,500,000*l.* sterling of additional capital in shares and loans. By the Midland Act powers are obtained to make sixteen miles twenty-five chains of new lines and other works, including a connecting line at St. Pancras, a station branch at Brixton in connexion with the London, Chatham, and Dover line, with branches between Royston and Darfield, Barnsley and Worsboro' Dale, at Burton, with other works; new capital in shares and loans 2,400,000*l.* The North-Eastern Act authorises the construction of short railways at Berwick, Newcastle, Tynemouth, and other places; proposed new capital, 1,665,000*l.* The Regent's Canal and Dock Company Act empowers the company to improve the canal and dock, to enlarge Limehouse basin, to build a river wall, to make railways to the Great Eastern Railway, and to use portions of that railway; also, to create a "Rent-Charge Stock" and a "Capital Stock A" for the purchase-money (of the Regent's Canal) of 1,390,540*l.*, and an "Ordinary Capital B" of 900,000*l.*, and to borrow 300,000*l.* The omnibus Bills of the principal railway companies are of less than their usual importance. The extent of the new works they contemplate is partly indicated by the capital powers asked for by their Bills. The Caledonian Company for various works propose to raise 88,000*l.*; the North British Company had only a very small Bill this year, additional capital 50,000*l.*; the Great Eastern have obtained an Act in which borrowing powers are not asked for. The Great Northern Company have obtained an Act to execute a number of comparatively unimportant works; new capital in shares and loan 400,000*l.* The Great Western Act authorises the construction of about 9¼ miles of line in the county of Monmouth, at Rowley Regis, and for other works; new capital 600,000*l.* The Lancashire and Yorkshire Company have obtained powers to construct various works, and to raise 666,666*l.* of additional capital. The South-Western have also an omnibus Act for various works, and powers to raise additional capital. The Cheshire Lines Committee, the Brighton, and the Chatham companies, have obtained Acts in which powers to add to their capital are not asked for. The South-Eastern Company have obtained an Act authorising the construction of 14½ miles of new lines, from Maidstone to Ashford, and at Sandgate, with powers to raise 466,000*l.* of additional capital. The Sheffield Company have obtained an Act authorising the construction of 6 miles of new line, additional capital 266,000*l.*

The largest new railway schemes sanctioned, in so far as mileage is concerned, are Irish. The Bundoran and Sligo Railway, of 20¼ miles, promoted by an independent company, capital 270,000*l.* was unfortunately thrown out in the Lords on standing orders; the Derry Central Railway, promoted by a new company, for a line of 33½ miles, capital 340,000*l.*, has passed the Parliamentary ordeal, and the "clerk of the Parliaments" has sonorously pronounced concerning it the authoritative regal formula, "La Reine le veult." The Sligo, Leitrim, and Northern Counties Railway, a new one, have obtained an Act to make 42¼ miles of line, starting with the fabulously small capital of 300,000*l.*, which, even for a single line, is a remarkably low figure.

The Tramway Acts passed relate to Belfast, Glasgow, Hull, Liverpool, Middleton, and Stockton, North Dublin, and Salford.

The Gas and Water Acts relate to Inverness, Millom (Cumberland), Cardiff, Manchester, Hindley, Ashton-in-Makerfield, Broadstairs, Barrow-in-Furness, Birmingham, Pontefract, Rochdale, Widnes, &c. The Gas Acts passed refer to Alford, Bath, Carmarthen, Cleethorpes, Cleveland (Skelton), Colchester, Heckmondwike, Longton, Longwood, Marlborough, Newport (Monmouthshire), Tunbridge Wells, Worthing, &c.

The Acts for water-supply relate, in addition to those mentioned as for gas and water, to the following places, among others:—Blackburn, Barby, Chelsea, Eastbourne, Greenock, Hamilton, Kilmarnock, Leicester, Maidenhead, Market Rasen, Oldham, Osset-cum-Gawthorpe, Oxford, Pemberton, Pontypridd, Portishead, Rotherham, Slough, South Staffordshire, Stroud, Truro, Weardale and Shildon, and Worksop.

The Dock, Pier, and Harbour Works Acts relate to,—Bristol Port and Channel Dock, Burntisland, Cork, Gravesend, Leith, London (London and St. Katherine's Docks), Lymington, Liverpool (Mersey Docks and Harbour Board), Milford, Romford (Canal), Southampton, Staffordshire and Worcestershire (canal navigation), Sutton Bridge Dock, Tees Conservancy, &c.

The miscellaneous Acts passed embrace a wide variety of subjects, including patents, charities, estates, assurance societies, roads, drainage, schools, Acts for a cemetery, an aquarium, a college, for bridges, and divers other objects.

The additional capital proposed to be raised under the Gas and Water Acts passed is comparatively small. Under the Bath Gas Bill power is given to raise 75,000*l.*, and to extend the limits of supply. The British Gaslight Company (Norwich station) is empowered to raise 100,000*l.*; the Cleveland Company, 62,500*l.*; the Commercial Gas Company (London), 562,500*l.* The Imperial Gas Company, by the Bill that they withdrew, asked for powers to raise 1,408,000*l.* of additional capital, and when the new capital has been subscribed, &c., 430,000*l.* more. The Millom Gas and Water Company have power to raise 50,000*l.*, and the Newport Company 62,500*l.* to be expended on works for the greater part. The capital to be raised for Waterworks' Bills include the following:—Barrow-in-Furness, 60,000*l.*; Blackburn, 250,000*l.*; Broadstairs, 15,000*l.*; Chelsea,

200,000*l.*; Eastbourne, 31,000*l.*; Greenock, 65,000*l.*; Leicester, 133,300*l.*; Manchester, 500,000*l.*; South Staffordshire, 250,000*l.*; Stroud, 90,000*l.*; Truro, 20,000*l.*; Weardale and Shildon, 750,000*l.*, &c. In a majority of the cases referred to, the additional capital will be expended upon new works.

The number of local Acts passed is below the average of the past five years, and the contests have been, with a few exceptions, fewer and less protracted and determined.

ENSEMBLE.

BY force of circumstances an architect is frequently compelled to adopt a certain standard, and his work should be judged accordingly. This is a rule too often lost sight of, and the critic is apt to take it for granted that the designer has had everything his own way, whilst he has been reluctantly forced into doing what, of his own accord, he would not have done. At the same time, it may be remarked that a man possessed of originality and force of character will, in whatever circumstances, stamp his work with his own individuality, and that he who is deficient in these qualities yields too readily to any obstacle in his way.

It is too often overlooked that the chief merit in architecture consists of beauty of form; elaboration is mistaken for beauty, whereas greater elegance and taste are more generally found in a plain building than in one profusely detailed. No amount of elaboration will make an ill-proportioned building otherwise than ugly, although, if judiciously applied, it will enhance the value of good proportion. Ornament ought to be considered a luxury, which is to be used sparingly, and not lavishly expended. To fritter away the principal masses with elaborate detail is inimical to grandeur and repose. In every case the ornament should be placed in subordination; "wherever the eye can rest, there place your ornament." By its delicacy it should enhance and give additional value to broad surfaces, upon which mainly depend the strength of the structure. A rectangular surface, for example, appears larger when bordered by a narrow frame. The narrowness of the mouldings, by contrast, enhance the breadth of the surface, the eye is arrested, and does not wander away from the confined space as it otherwise would be disposed to do. Hence the value of simple mouldings as ornamental features.

"The highest finishing is labour in vain, unless there be at the same time preserved a breadth of light and shadow," says Sir Joshua Reynolds; and if this be true of painting, much more so is it of architecture. The degree of finish should correspond to the size of the ornament; if it is large it should be broadly treated, if small, with delicacy. Exaggeration of parts is, however, to be carefully avoided, for when any member or feature of a building is increased beyond its due proportions, grotesqueness or deformity is sure to be the result. The proportions of natural objects used as architectural details are often exceeded, and necessarily so, as they must be in proportion to the other features, and conventionalised so as to produce the desired effect; for as the perceptive powers do not increase in proportion to the size of the object regarded, it is necessary, when the scale is increased, to simplify the details, and accentuate the leading lines. This conventionality of treatment should be kept up throughout when once adopted, so as to avoid confusion by the presence of different standards in the same design.

On the other hand, by reducing a grand design below a certain scale, a toylike effect is produced and the taste is offended. The elements of a fine building consist of grouping and contrast, or depth of light and shade; without these, grandeur is impossible, and the use or abuse of these will be found to constitute the true test of excellence in every building, ancient or modern. Grouping consists in arranging the masses of a building so as to produce an effective composition; and light and shade is produced by contrasting the masses so as to give to each its due effect, and generally by bringing into prominence the bearing members required in construction.

If a building, then, is well proportioned, gracefully grouped, and effective in light and shade, it possesses the requisites of good architecture, however plain it is. And yet, withal, it may not be a fine building in the truest sense of the word. There is a certain individuality, originality, call it what you will (that no originality is displayed in modern works we cannot admit), without which the charm is wanting. It is doubtless of advantage to promulgate general rules and axioms, but the mere observance of these is not all sufficient. The architect has other things to consider besides proportion, grouping, and chiaroscuro. The success of his work depends as much upon expression as does the work of the painter, and no rules can be laid down for such—the power to give it must be inborn with the man, a part of his nature.

Every landscape-painter is aware of how much a scene may be made or marred by a building. If judiciously placed and in good keeping, it may be the centre-point of the composition; an object which renders the scene more attractive than before; but, on the other hand, it may be so placed, and of such a character, as to spoil the finest of landscapes. Travellers to the Highlands at this season, in passing Stirling, may observe a striking example of this kind. Upon a wooded crag, situated in a picturesque amphitheatre of hills, is placed a brobdignagian tower, in imitation of a keep. This monument, which is erected to commemorate Wallace, the national hero, is of such size and obtrusiveness as to spoil a most beautiful landscape. On a less dominating site this erection might have formed a picturesque addition to the spot; it is an eyesore where it now stands.

So, too, in street architecture, the surroundings of a proposed structure are matter of grave consideration. Style is not so much to be considered as the leading lines, which should all tend to one result,—not always to mathematical exactness, but to harmony and gracefulness of composition. One of the most beautiful groups of buildings in the world is that of St. Mark's Place, Venice. Yet the buildings are very various as regards style, and are not symmetrically arranged. It is not given to any one architect to produce such a result, but he may contribute towards it, or he may render its ultimate fulfilment impossible. The last comer may spoil the whole. An architect, then, should have the eye of an artist and the imagination to conceive of the possibilities and probabilities of the situation. He should aim at producing picturesque combinations rather than in obtruding his own work upon the observation. It is this obtrusiveness and self-assertion in most modern work which destroys the general effect upon which a group of buildings depends. Each new comer strives to outbid his predecessors, irrespective of other considerations, and, after all, the result is generally unsatisfactory. Even as regards the building itself, its height may be out of all proportion to its breadth, or the façade overloaded with staring details, and the spectator, if possessed with good taste, looks upon it with disgust rather than with admiration.

In designing a building for an isolated position, there is not the same temptation to self-assertion and obtrusiveness as where other architectural works are in juxtaposition. Still there are many instances to the contrary besides the Wallace Monument above referred to. Not only is that structure too large, but the general conception is essentially bad for the position, which was previously fixed upon. Its leading lines are perpendicular, and enter into competition with the surrounding hills, a feeling which is still further suggested by the tower being surmounted by a serrated crown. The Greek temples so situated never seem out of harmony with the surroundings, their low horizontal lines and simplicity of contour do not come into competition with the undulating lines and aspiring summits of the hills, but contrast with and add value to them.

The Gothic cathedrals and churches are also admirably fitted for their situations,—it is upon the plains that we find the lofty spire, as at Salisbury, and upon the heights the massive and less aspiring tower, as at Lincoln, and so was it elsewhere. If a spire was the culminating feature of a Gothic church situated upon a height, it was where no work of nature came into competition with it, and even then the leading lines of the composition were carried out, as at St. Michael's Mount.

It is not enough, therefore, that a building should be beautiful as an architectural design simply, but its masses, leading lines, and details should be so arranged as to be in harmony with the surroundings, and produce an effective *ensemble*.

Royal Architectural Museum. — The Council of this Museum have abolished the entrance fee of 6d., and now admit persons free daily between ten and four.

THE ANGLICAN CHURCH IN ZANZIBAR.

OUR readers may be glad to know that the Protestant church which is in course of erection from the designs of Mr. C. Forster Hayward, F.S.A., in Zanzibar, under the auspices of the Central African Mission, is making satisfactory progress. Bishop Steere, in a recent letter says:—

"The church in the Slave Market grows apace, and is the subject of much attention to both Europeans and natives. I hope we shall make it a really noble building. We are spending at present about 100*l.* per month on the building; it is already much admired and wondered at by the townspeople; the native masons are getting proud of their work, and so are taking more and more pains. Our school and preaching go on in the room adjoining, and I get very attentive congregations in spite of a vigorous effort of the leading Arabs to keep the people away. The Sultan is said to have warned his friends not to come near us; and one of the learned men in the town who is a great friend of mine told me that the Sultan asked him, 'how he, a teacher of their own, could go to hear the Gospel expounded;' and that he replied, 'the Gospel was good and right, and therefore it could not be wrong to listen to it.'"

In opposition to this we are glad to hear from Mr. Hayward that the Sultan accepted a set of plans from him personally, and said his "Thank you," very distinctly.

DEATH OF MR. H. H. VALE, F.R.I.B.A., OF LIVERPOOL.

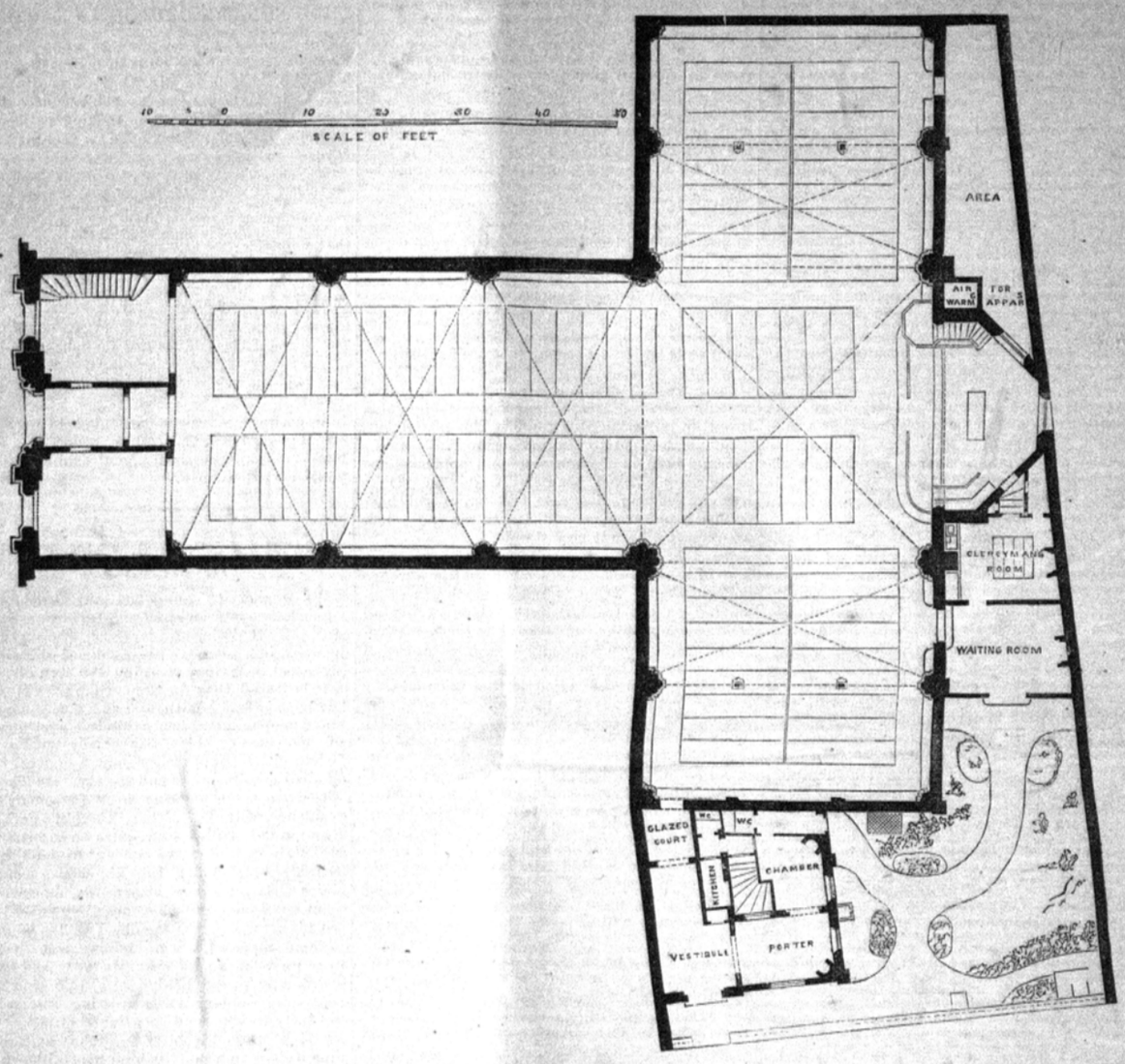
WE regret to announce the death, under somewhat mysterious and painful circumstances, of Mr. H. H. Vale, of Liverpool, who was found drowned in a pit near his residence at Fairfield, Liverpool, on Friday morning, the 27th ult.

It is stated that for some time past Mr. Vale has been in bad health, and as a consequence, or an accompaniment, has exhibited a strangeness of demeanour. This was chiefly shown in an indisposition to see visitors, and a general feeling of dislike to business and society. On Thursday afternoon, while walking in the grounds of his residence, Stanley House, Oakhill Park, Old Swan, a lady called to inquire as to his health. Mr. Vale left her to be entertained by his daughter, and going into the house went upstairs. Immediately afterwards, however, he went out again, and as some time passed without his returning, the members of his household became alarmed. This feeling was deepened upon its being found that Mr. Vale had left his watch and guard behind him, and that a vial containing laudanum was missing. Search was instantly made, and continued until Friday morning, when his body was found at half-past nine o'clock in a pond behind his residence. The missing vial was found empty in his pocket, and the presumption is that after taking the laudanum Mr. Vale threw himself into the pond. The water in which the body was found was about 8 ft. deep. In conjunction with Mr. Sherlock, Mr. Vale designed the Walker Art Gallery, of which we gave a view, and was a past President of the Liverpool Architectural Society.

Amongst Mr. Vale's other works in Liverpool and the neighbourhood are the Oxford and Cambridge-chambers, the Young Men's Christian Association Hall, Mount Pleasant (now in course of erection), and many churches. Mr. Vale's kindly disposition and affable manners made him many friends, by whom his death, under such melancholy circumstances, will be greatly regretted.

At the inquest which has been held upon the body of the deceased, it was stated in evidence that for the past two months he had been in very bad health, and had not been to his office for about three weeks. Dr. Haywood, his medical attendant, considered that he suffered from an over-wrought brain. The jury returned a verdict to the effect that deceased committed suicide by drowning himself while in a state of unsound mind.

Memorial of the late Earl of Hardwicke.—It is proposed to re-erect the grand Early English tower of Haddenham Church, near Ely, to the memory of the late Earl of Hardwicke, as recommended some time ago by the present Bishop of Winchester. The site chosen for this monument is on the highest point of the Isle of Ely, and the tower, when completed, will form a prominent landmark. It was originally erected about A.D. 1272, and many of its principal features were carefully preserved when it was found necessary to take it down some time ago in consequence of its ruinous and unsafe condition.



THE CHURCH "DE L'ÉTOILE," PARIS.——*Plan.*

EVANGELICAL CHURCH DE L'ÉTOILE, PARIS.

THE façade of the Evangelical Church of l'Étoile, in the Avenue de la Grand Armée, has been recently completed. It is 22 mètres in height, by 11·50 in width; the first design was 25 mètres in height by 12·50 in width, but the architect was obliged to lessen it, from motives of economy. The style partakes both of the fifteenth and sixteenth centuries, seen through French eyes, and the façade is entirely constructed in freestone.

The gablets of the two side entrances are supported by the apocalyptical symbols of the four evangelists,—the angel, the eagle, the ox, and the lion; the great moulding of the principal entrance is carved with a garland of wheat and vine leaves, typifying the communion; two angels support the gablet of the centre portion, the one bearing the motto,—"God is love," and the other,—"Peace be with you."

If the dimensions of the façade leave something to be desired, the interior dimensions gain by contrast. The nave is 38·50 mètres in length and 10 wide, the transept 30 mètres in length and 10 in width, forming a Latin cross; the whole, including the organ gallery above the principal entrance, furnishing seat room for 1,400 persons.

The walls of the building being intended to serve eventually as party-walls to neighbouring constructions, windows were inadmissible in some parts, and have been replaced in the interior design by wall arches, forming spaces for inscriptions from the Bible.

The cost, which was determined beforehand, not permitting the construction of galleries in the transepts, the latter have been built so that the galleries can be added afterwards, if thought necessary, giving 200 seats in addition, and raising the total of sittings to 1,600.

The vaults of the choir are blue, with a gilt star powdering, and in the three windows of the same portion are placed stained-glass designs representing the birth, death, and resurrection of Christ; the rest of the windows are filled with diaper-work in grisaille.

A second entry is made on the side next the Rue Poisson, by the sacristan's lodge, and through a garden into the porter's entrance-lobby. The garden is intended as the site of a Sunday-school to be ultimately built.

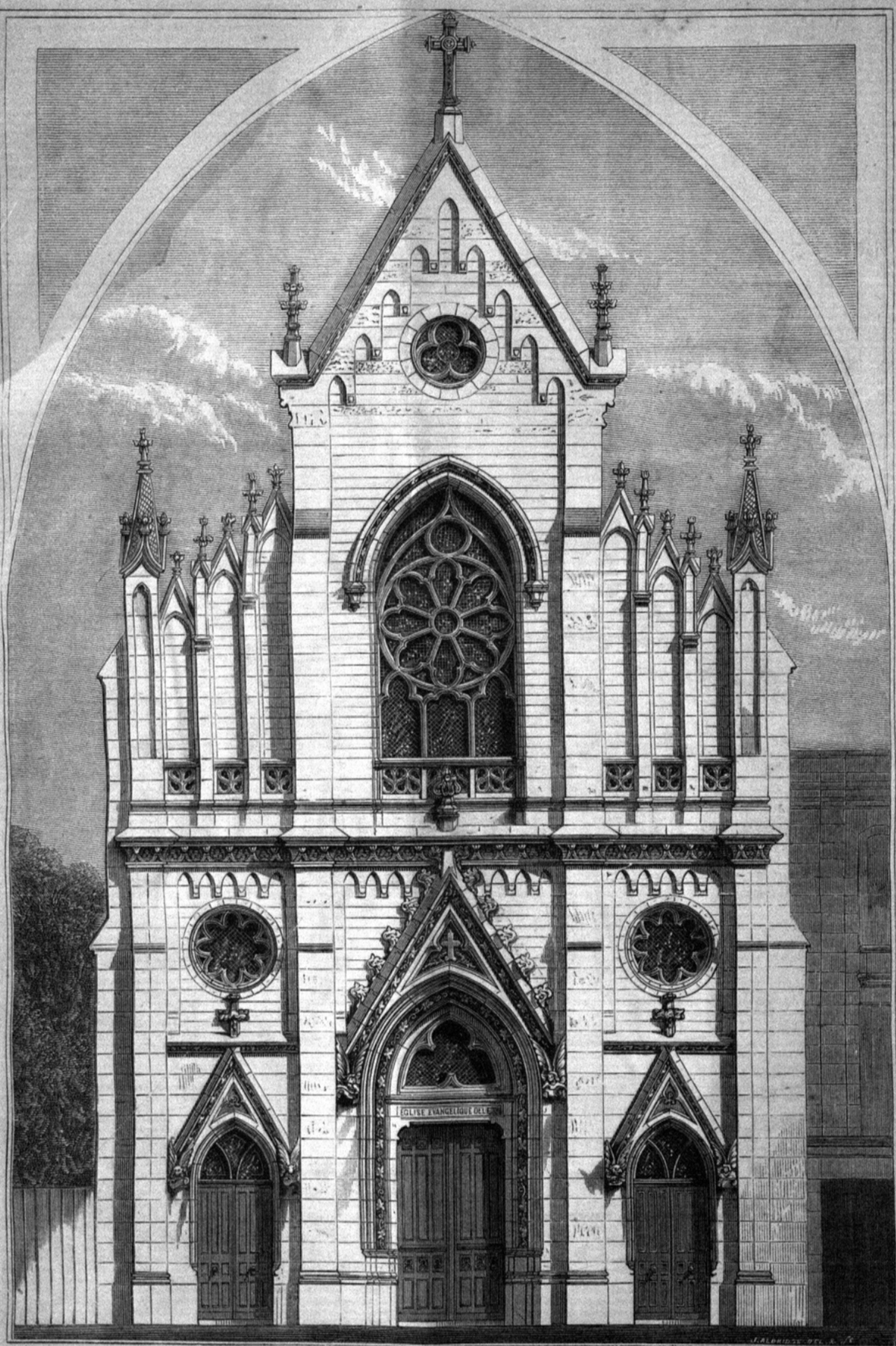
The cost has been about 190,000 francs,—a very moderate sum, considering the surface of ground covered, and that the foundations had to be taken to a depth of 9 mètres. The collection of the necessary funds has been entirely owing to the exertions of the minister, M. le Pasteur Berrier, who has for a long time past found the existing chapel far too small for his congregation.

M. W. Hansen, of Paris, is the architect.

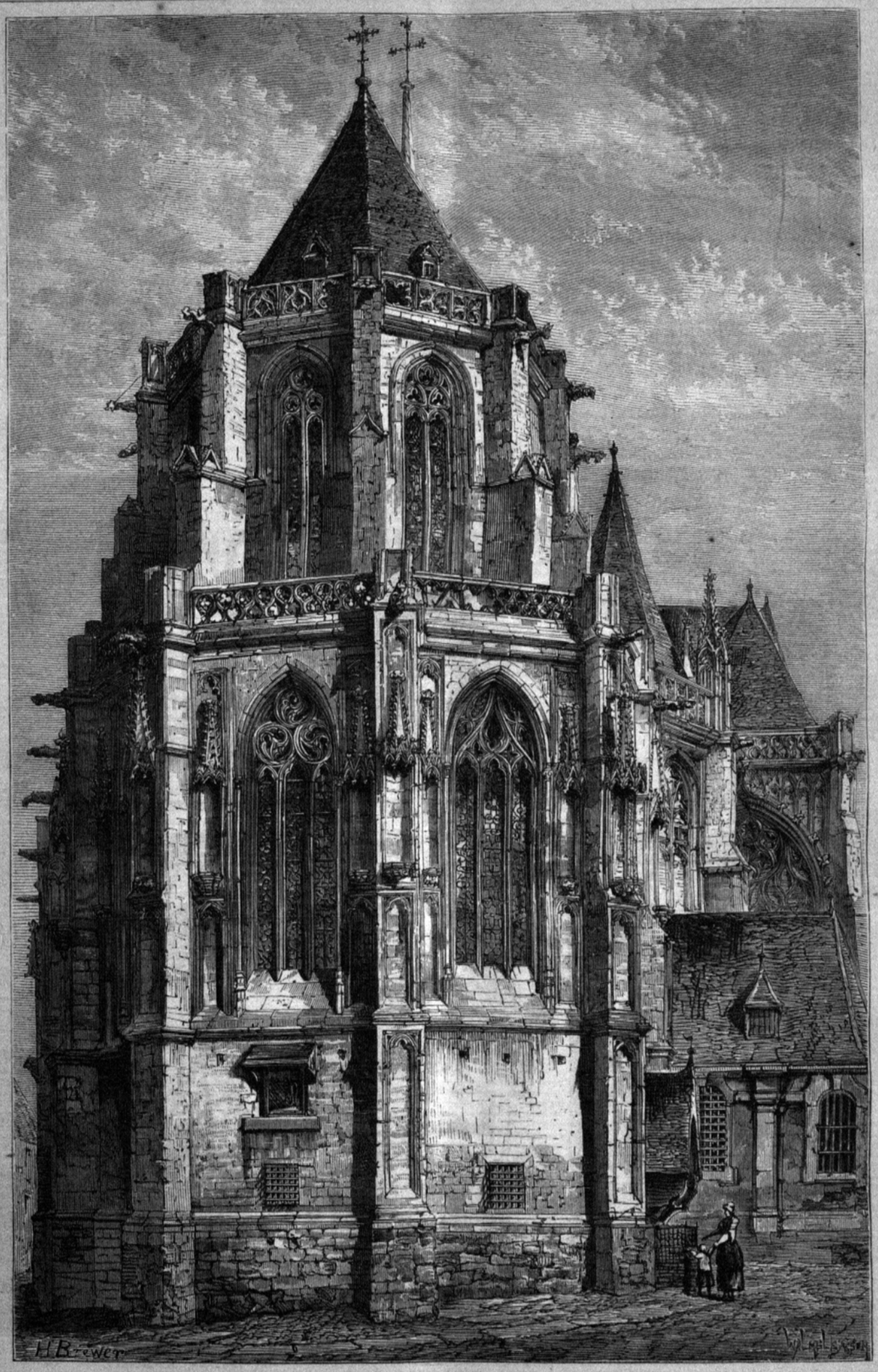
THE GERMAN SANITARY CONGRESS.

THE following subjects will be discussed at the third meeting of the German Sanitary Association, to be held at Munich on September 13, 14, and 15:—1. The determination of a plan for the investigation of the occurrence, as to place and time, of epidemics of typhus: reporter, Professor von Pettenkofer, Munich; co-reporter, staff-surgeon, Dr. Port, Munich. 2. Hygienic requirements of new buildings, especially in the new quarters of large towns: reporter, Dr. Varrentrapp, Frankfort; co-reporter, engineer Bürkli-Ziegler, Zurich. 3. The demands of public health in relation to food, in orphan asylums, barracks, prisons, and almshouses for old persons, and also in public kitchens: reporter Professor Voit, Munich. 4. The aims, means, and limits of sanitary police control over certain important articles of food, especially bread and meat: reporter, Dr. Heusner, Barmen. 5. Public slaughter-houses, and the introduction of a general regulation of the slaughtering of animals; also the compulsory examination of meat, with special reference to the obligation of the district authorities to recompense the butchers: reporter, Herr Gobbin, Görlitz; co-reporter, Dr. P. Börner, Berlin. 6. The formation of a general registration of deaths in Germany, with, if possible, medical certificates of the causes of death.

The Tay Bridge.—On the 26th ult. the first of a series of fourteen piers to support the large central spans of the Tay Bridge was safely launched and towed out to the middle of the river, where it was moored, as the weather was too stormy to permit of its being satisfactorily lowered into position. This is the largest pier yet constructed. The next pier will be ready for launching in a week or two. Sixty-four piers have now been sunk, and only twenty-five more have to be added to complete the bridge, the total number being eighty-nine.



THE EVANGELICAL CHURCH "DE L'ÉTOILE," PARIS.—M. HANSEN, ARCHITECT.



THE CHURCH OF NOTRE DAME, AT HAL. A.D. 1341 TO 1409.

NOTRE DAME AT HAL.

THE Church of Notre Dame at Hal, about twelve miles from Brussels, although not a very large building, is a singularly beautiful and valuable example of the perfected Gothic of the fourteenth century. The church consists of a nave and aisles, western tower, with an octagonal baptistery at the west end of the south aisle, and a chancel with aisles of the same width as those of the nave, of which it is in other respects a continuation. There is a large chapel opening out of the north aisle of the choir, and two porches, one of which, that on the south side, is a very elaborate and splendid example of late fourteenth-century work. The aisles of the chancel are not carried the whole length, but end in chapels at the second bay from the chancel arch. The chancel terminates to the east, with an apse of remarkable beauty. It is two stories in height, the upper one being a continuation of the clearstory. In place of aisles there are internally deep arched recesses, filling up the spaces between the buttresses.

Internally, the church is singularly rich and elaborate, the whole of the walls above the arches being covered with tracery, and in the choir elaborate arcades of open tracery are carried in front of the clearstory windows. The church is singularly rich in furniture. The ancient rood is still in existence, supported upon a beam with excessively elaborate pierced tracery. The high altar is a remarkably-beautiful example of very Early Renaissance work, adorned with charming bas-reliefs in white alabaster; at the back is a singular vaulted loft for the exposition of relics, which is at present concealed by a hideous reredos, an example of the very worst taste of the last century. In the centre of the choir is a fine old eagle lectern of brass, and there are some good Mediæval candlesticks, and a remarkably fine corona of iron richly decorated. The font is of brass, ornamented with statues and canopies, and has a lever of iron, to lift off the cover, which is ornamented with a statue of St. John the Baptist. This font is somewhat similar to one we illustrated some time back in the cathedral at Bois-le-Duc in Holland. There is an ancient lectern of iron in the baptistery, and the screen is a good example of workmanship executed in the same metal. There is a "Pieta" carved in stone near to the west doorway; it is the work of the fifteenth century; but perhaps the finest things in the church are the "wind porches," these, which are generally such very ugly features, are here singularly beautiful. They are in the Early Renaissance style, and are ornamented with panels, filled with very delicately-carved arabesques and foliage, niches, statuettes, masks, &c., all carved in oak, most highly and delicately finished. This fine and interesting church was commenced in the year 1341 and completed in 1409.

THE DISCOVERIES AT CLEEVE ABBEY.

SOMERSETSHIRE ARCHÆOLOGICAL SOCIETY.

THE twenty-seventh annual meeting of the Somersetshire Archæological and Natural History Society has been held at Frome. The Earl of Cork and Orrery, as president, delivered a valuable address, which is reported, together with other proceedings of the Society, in the *Bath Chronicle*. In the course of the meeting,

Mr Danby Seymour read the following observations on the recent discoveries made at Cleeve Abbey by Mr. C. H. Samson, of Dunster:—"I accompanied the Rev. Mackenzie Walcott, Precentor of Chichester, to these interesting ruins, for the purpose of making a plan of what he considered to be the remains of the church, which until now has been a matter of doubt to many who have visited the spot and written upon the subject. The owner of the property, G. F. Luttrell, Esq., of Dunster Castle, who takes the keenest interest in the matter, at once placed a gang of labourers at our disposal, and in a short time the most important parts of the foundations of walls and columns were exposed to view. I send with this communication a plan of the whole of the buildings, both ecclesiastical and domestic, and the following explanation, taken principally from the notes of Mr. Walcott. The church was 161 ft. in length, of the purest Cistercian type, consisting of a nave of five bays, with aisles 100 ft. by 58 ft. 6 in., a central tower, a transept of 95 ft. by 40 ft., with two eastern chapels, 13 ft. 6 in. square, in each wing, and a short eastern presbytery, 29 ft. by 17 ft., without aisles. The pillars of the nave were round; a beautifully moulded base nearly perfect was discovered in place, and, like the rest of the stonework found, there was no trace whatever to be seen on the surface of the ground of what lay beneath; here and there were indications of masonry, but on examination they only proved to be masses of fallen walls; portions of three other bases were found in their places. The aisles were 11 ft. wide, and the central alley 30 ft. A portion of the foundations can be seen on which the stalls and rood screen stood; the space enclosed is 14 ft. by 12 ft. 6 in., and is partly covered with encaustic tiles, evidently on the proper floor level, although not as they were originally laid: a portion of this space is under a huge piece of fallen wall. A large quantity of encaustic tile paving has been found, either dug up out of the earth or built into modern walls; there seem to be as many as fifty different patterns,—heraldic, geometric, and others, in various colours,—black, red and white, and glazed green; many of the same patterns were found in the old chancel of Dunster church. Among the heraldic tiles are the arms of Raleigh, Clare, Pointz, Trevet or Treble, Sydenham, Bardolf, Cary, Beauchamp, Fitz Nicholas, Furneaux, Peverill, Palton, Botetler, and Richard Earl of Cornwall, many of whom had lands in the county, and under the Mohun family; some of the tiles bear capital letters, B, C, T, I, O, M. The walls of the south aisle of nave remain, with traces of the two processional doors, and three windows about 4 ft. wide between the inside splays, and about 14 ft. from the floor level; they are at present walled up, and no traces of the outer faces are visible. The west and south walls of the transept also are standing, with a portion of an eastern aisle chapel 13 ft. 6 in. square, with part of a piscina, remains of a stoup, and the foundations of the altar; there are remains of clearstory windows in the south wing. The western jamb of the eastern cloister door remains, with a portion of the outer arch, and the springer of the inner arch. The south wall of transept shows the central door into the sacristy. The cloistral and domestic buildings have already been the subject of an elaborate paper by the late Rev. F. Warre. I need, therefore, merely describe the subsequent discoveries made while clearing out some of the rubbish which has accumulated during the time the buildings were used as a farm homestead, which is now happily no longer the case; in a short time Mr. Luttrell intends to remove the modern walling, and other unsightly innovations, now no more needed for cattle sheds. On the east side of the cloister garth, which is 78 ft. square, is the dormitory, on the upper story; it is a magnificent room, 137 ft. 6 in. by 24 ft. 5 in. The north wall contains the door opening on the night stairs to the transept, and a skew door probably for watching the church lights. The substructure includes—(1) the sacristy, 22 ft. 4 in. by 12 ft., with a round window, the hood moulding only remaining; a large double aumbry in the west wall, which had shelves and wooden doors; an aumbry and water-drain on the south, and to the north another locker, and the door into the transept. (2) A chamber, 22 ft. by 10 ft. 6 in., lighted by a single lancet; the original large entrance arch has been filled in with one of smaller dimensions. (3) The chapter-house, vaulted in two spans, on which traces of wall painting are visible; the foundations of the eastern end are now laid bare, which shows the whole building to have been 46 ft. 10 in. in length, by 21 ft. 4 in. in width. (4) Day stairs to dormitory. (5) Parlour 16 ft. 11 in. by 11 ft. 7 in., lighted by a double lancet window, and having a locker on the north, and a deep recessed arch at the side of the door. (6) The slype to the cemetery, 29 ft. 8 in., with two double aumbries in the north, and a pair with a door in the south wall, opening into the (7) day or common room, 60 ft. by 22 ft. 6 in. It was vaulted in two spans, with a central arcade resting upon three pillars. In the east and west walls, at the south end, are two doorways, opposite to each other. The original floor-level is several feet deeper than the present; the doorways are at least 7 ft. high. The south side of the garth is principally occupied by the refectory, over an Early English substructure, which includes (1) the tresaunt to the conventual garden, 30 ft. 8 in., by less 3 in., with a south door and loop and bench where the porter of the cloister sat. (2) The calefactory, divided into three chambers, the first, 22 ft. 8 in. by 8 ft., contains a window, with seats, and a garderobe. The central compartment, 22 ft. 2 in. by 15 ft. 4 in., is entered by its special door, and also by a skew-door, pierced in the partition-wall, on the west, and adjoining the entrance to the next chamber, 22 ft. 2 in. by 16 ft. 5 in. Each of these two divisions has a fireplace set between two windows. Mr. Walcott's impression is that, in the changes of the Perpendicular period the original day-room, being divided into bays by woodwork screens, and this room, originally a long cellarage, had their destinations interchanged. At the south-west corner there is a door, opening into a passage, 6 ft. 6 in. wide, under the hall-stairs, which contains a window and garderobe. Next is the (3) entry to the abbot's kitchen, with a door opening on the hall-stairs, and having a corresponding door opposite to it. Outside the refectory-stairs are traces of a large porch, with a gabled front over the door, and a second building, forming a serving-room, with a five-light window, of timberwork, which connected it with the conventual kitchen. The western alley of the cloister shows a buttressed front, with an upper range of chambers, occupied by the converts or lay brothers, much mutilated. It is pierced by a gateway-porch, with woodwork, retaining some carving on the south, and a panelled Perpendicular arch on the north. Southward of it is the conventual kitchen, 33 ft. 11 in. by 13 ft. 6 in. The arches which enclosed its window remain. They resemble the west side, which were filled with Perpendicular windows, of four lights, and portions of this tracery remain. These four bays formed carols for study. At the south end is a straining arch. The north alley has been entirely swept away. In the centre of the south wall of the nave is a trefoil-headed seat, for the abbot or claustral prior, in cloister time.

CASTLEFORD AND WHITWOOD MAIN DRAINAGE COMPETITION.

ON Thursday, the 26th of August, a meeting of the local boards of Castleford and Whitwood was held for the purpose of deciding upon the first and second best schemes for the joint drainage of the two districts. Twelve schemes had been submitted, with estimates varying from 7,000*l.* to 29,000*l.* These had been considered at different meetings and reduced to two, which were to be decided upon. The Boards, after a short consultation, awarded the first premium (100*l.*) to the plans sent in under the motto of "Union," and the second (50*l.*) to the plans sent in under the motto "Experience." The authors of the successful designs are Messrs. Malcolm Paterson, of Dewsbury, and Mr. Wm. Wheater, of Leeds; the authors of the second being Messrs. Brierley & Holt, of Blackburn.

The position of the two districts at the confluence of the rivers Aire and Calder, with a large extent of flat alluvial land, renders them difficult of drainage. The scheme adopted comprises two separate intercepting sewers, storage tank, two pumping stations, and thirteen acres of land for treatment of sewage by intermittent filtration. The estimate for these works is 22,684*l.* The present population of the two districts of Castleford and Whitwood is 12,000, with a ratio of increase estimated at 100 per cent. in fifteen years.

THE WHITELAW TESTIMONIAL FOUNTAIN AT COATBRIDGE.

A HANDSOME fountain in commemoration of the many valuable services rendered to the inhabitants of Coatbridge by Mr. Alex. Whitelaw, M.P., has been formally inaugurated by Col. Buchanan. The fountain has cost between 2,000*l.* and 3,000*l.*, and so liberally have the inhabitants responded to the appeal made to them, that after paying that amount there was a sufficient balance on hand to pay for two marble busts of Mr. and Mrs. Whitelaw, from the studio of Mr. Ewing, of Glasgow, and also to defray the expense of making a square about the fountain to be called the Baird-square, in honour of a wealthy relative of Mr. Whitelaw, and who is the head of the firm to which he belongs. The testimonial fountain itself is built of Aberdeen and Peterhead granite, and is erected from designs by Mr. Hugh H. McClure, architect, Glasgow, the granite work having been executed by Messrs. Milne & Wishart, Aberdeen. The pedestal is placed on a basement of two well-elevated steps, which lead up on four sides to an equal number of red granite drinking-basins. The pedestal, which is about 10 ft. square, is raised on a floor or platform to a height of 12 ft. above the level of the street. The pedestal is ornamented with rusticated corners and raised

enrichments, having on each face the head of a lion, the water flowing from the mouth into the drinking-basin below. There are four large tablets above the lions' heads which contain the inscriptions. Surmounting these is an arched canopy supported on four massive red granite columns, having moulded bases and finely-carved capitals; both the arch and cornicing over the canopy are enriched with carved key-stones and cantilevers. An octagon blocking course rises above this entablature over which is carried a pear-shaped dome, enriched with massive and handsomely-carved red granite vases. The height of the whole erection, from the level of the street to the top of the vase is 38 ft. The following is the inscription on the fountain:—"Erected by subscription in honour of Alex. Whitelaw, esq., M.P., in recognition of the many valuable services rendered by him to the community. Inaugurated 10th August, 1875."

SUGGESTIONS FOR THE BETTER CONSTRUCTION OF DWELLING-HOUSES.*

The subsoil of every area intended for the erection of dwelling-houses thereon, should be properly drained before the buildings are begun.

If the soil be clay, it should be burnt, and a layer laid down to improve the drainage, and purify foul waters.

The entire site of every dwelling-house should be covered with concrete, Portland cement, or other impermeable material.

The footings of every house should stand upon concrete.

Every wall should have a damp-proof course of slate, asphalte, or otherwise.

No staircase should be less than 3 ft. wide, with proper openings for ventilation, and should be always external to the rooms.

No habitable room should be less than 9 ft. in height, or less than 150 ft. superficial area. It should be provided with a window at least 16 square feet in size, and a fireplace.

Every room in a basement, having an external wall and provided with a window and fireplace, should have an open area from 6 in. below the flooring along the whole length of the external wall, and at least 4 ft. wide. The ceiling of such room should be at least two-thirds of the height of the room above the top of the area wall, or surface of pavement of street. The surface of the said area should be covered with cement concrete.

Every house intended for human habitation, unless every room can be lighted and ventilated from a street or open space, should have an open space in the rear thereof, of at least 150 square feet in area, and never less than 10 ft. in width in any part. Such space to belong exclusively to the house.

All block buildings, meaning thereby, buildings intended for the occupation of numerous families, and more than 25 ft. wide in their largest frontage, should have staircases and passages external to the walls of the house, to provide ready escape in case of fire, and to prevent the spread of disease.

A suite of rooms in such houses intended for the occupation of a separate family should have no communication with other rooms; and each suite of rooms should be entered directly from the street or outer staircase. The houses and rooms should be so arranged that through ventilation is secured.

In the case of block buildings, at least half of the superficial area should be left open for ventilation, and a space of at least 30 ft. in depth should be left between the wall of each block, or of one block and of any other house, back and front.

The water-closet, or other contrivance for the like purpose, should be always detached from the house, or so situated that there should be space for a current of air between the house and the closet.

The water-supply for drinking, cooking, &c., should be separate from the supply to the closet, and should be constant.

No house-drain should be carried under the basement of a house, but have a fall to a sewer in the rear.

The inverts of sewers should be made of Portland cement or of other impermeable substance.

In all new neighbourhoods the paving of the roads and foot pavements should be completed before the houses are permitted to be occupied.

No new house should be allowed to be occupied without a certificate from a Medical Officer of Health or a surveyor, that the regulations have been complied with, and that it is fit for human habitation.

* By George Ross, M.D., Medical Officer of Health for St. Giles' District.

A PROCESS FOR PERMANENTLY PRESERVING IRON FROM RUST (OR OXIDATION).

Dr. Wm. H. Sterling is making known his system for preserving the entire structure of iron. He says:—

"The nature of my invention consists in the impregnation and saturation of the structure of the metal, iron, with a *non*-oxidising or *non*-oxidisable substance or substances by means of forcing these *non*-oxidising or *non*-oxidisable substances into the intercellular or interstitial spaces of the metal by suitable pressure while the iron is in a properly heated and expanded condition, induced by heating the iron in a vacuum, or in a simple chamber, as hereinafter described."

As this invention is capable of being variously mechanically applied, as the different forms of iron articles to be preserved, and the non-oxidisable substances used may require, it is not necessary to describe all of the various mechanical means which can be used in its application; he therefore gives only one of the methods by which his invention may be applied, and which he recommends as being eminently practical and useful:—

"A vessel of iron, or any suitable material of sufficient strength, is made in the form and size best adapted to the shape and dimensions of the iron article to be treated, with the lid so constructed that the vessel may be closed hermetically, and at the bottom suitable pipes are arranged for conveying steam and water, alternately, for the purpose of heating and cooling the interior, as hereinafter described."

Suitably connected with this vessel is a power pump or forcing apparatus for producing the necessary pressure, also the proper appliances for obtaining a vacuum. The iron to be treated is now heated to the desired temperature, as hereinafter stated, and placed into the above vessel, the top closed hermetically, and dry or superheated steam turned into the above-described pipes at the bottom, to keep the metal at the required temperature; also, at the same time, an atmospheric vacuum is produced by an ordinary air-pump connected with the chamber; the proper quantity, sufficient to fill the vessel, of pure parafine or parafine in solution with one of the pure heavy mineral oils, having been also previously heated to the required temperature, is now let into this chamber and forced, under the proper pressure from the forcing pump, into the intercellular or interstitial spaces of the iron, those spaces having so greatly enlarged by the expansion of the metal from the heat and removal of the atmospheric pressure as to most readily admit the subtle, penetrating *non*-oxidisable hydro-carbon preservative in sufficient quantity to for ever after protect the entire structure of the iron from oxidation or rust by any of the ordinary corrosive or oxidising elements. When the iron has remained under this liquid pressure a sufficient time, it is gradually cooled by turning cold water instead of steam into the pipes, the pressure being kept up, however, until the iron is cool.

Certain qualities of iron may be treated without the atmospheric vacuum, but as the iron expands very much more and greater pressure is obtainable by its employment, and the additional cost not to be considered, he recommends its use as most desirable.

We do not know to what extent the value of the process has been proved by time.

THE YORKSHIRE ARCHÆOLOGICAL AND TOPOGRAPHICAL ASSOCIATION AT BEVERLEY.

This Association held its ninth annual excursion on Friday, the 27th ult., Beverley being the *locale*. At half-past one o'clock the Association was officially received by the ex-mayor (Mr. Silvester) and corporation. The charters and other muniments of the borough were exhibited, together with objects of antiquity found in the district, and illustrative of the prehistoric, Celtic, Roman, and Mediæval periods. These were arranged by Mr. W. Stephenson, of Beverley, and included, amongst others, the corporation maces, two silver chains formerly belonging to the borough, and the silver chain of the "Ancient Company or Fraternity of Minstrells in Beverley," a guild which is said to have extended from the Trent to the Tweed, and which had its head-quarters in this town and borough. The reception being concluded, a visit was paid to

St. Mary's Church.—Mr. Fairless Barber, after describing the chief architectural features of the church, made some observations on the works of restoration now in progress. He said the members present all knew, and had the greatest respect for, Sir Gilbert Scott, under whose direction the restoration was being carried out; but it could not be denied that, in the present instance, Sir Gilbert had materially altered the character of that church. He did not wish to say a word against the method he was pursuing in doing it; but he merely wished to draw attention to the fact that the fabric was being materially altered. The effect, no doubt, would be exceedingly pleasant to the people of Beverley, but there was a distinct alteration in the line and the form of the church. He had no doubt there might be reasons for it, and there might be some particular wishes of the inhabitants of Beverley which Sir Gilbert Scott would be bound to carry out; but at the same time there was a distinct departure from the original form of the fabric. He thought it was their duty to call attention to circumstances of this kind, and he hoped the people of Beverley would make it clear to everybody who visited the building that it was in an altered condition, so that no unwary stranger might be misled to think he was in a church arranged as it was when the original fabric was built.

On leaving the church the company proceeded to the Norwood Rooms for luncheon, at the conclusion of which they visited

The Minster.—Mr. Fairless Barber again acted as *cicerone*, and pointed out the varieties of style in the architecture of the building. The Lancet, or Early English style, he said, was as pure and as beautiful an example of Gothic work as could be found anywhere. The other work was equally beautiful and pure in its particular style. One feature in the Minster, which was not apparent at first sight, and which was only disclosed by the investigations of Mr. Petit, when the town was visited by the Archæological Institute in 1847, was that the original plan seemed to have been to stop short of the second transepts, and to have simply an ambulatory round the altar, which would stand somewhere where the present screen stands; in point of fact, that the second or eastward transept, with its chapels, was an addition to the original conception of the builders. With reference to the history of the church, there was nothing earlier than what they saw of it above ground. There was nothing whatever of any former building remaining, unless, indeed, it was the font, which appeared to be of an earlier date than anything else in the fabric. The miscreres were certainly unique in the charming humour with which they illustrated the social life of the period to which they belonged. Mr. Micklethwaite, referring to the alterations which were going on in the edifice, said he hoped the old rood-screen would not be removed, for to remove or destroy it would be to obliterate an important part of the history of the church. Other portions of the minster were individually inspected, and the party returned home soon after six.

THE WATER-SUPPLY OF OLD LONDON.

THE BAYSWATER CONDUIT.

Mr. George Musgrave, M.A., has written an interesting letter to the *Daily News* on this subject, suggested to him by the recent discovery of the subterranean chambers beneath Oxford-street, which formed part of the system of water-supply from the far west to the centre of the metropolis. The water was derived from springs in the gravelly soil of St. John's-wood, and took the direction of Grosvenor and adjoining squares on its way to Cheapside. Mr. Musgrave says:—"I am old enough to remember the stone-built conduit house, from which Conduit-passage and Spring-street, Paddington, derive their designation. It stood in a meadow, described in an old document in my possession as situate between Paddington church (close to the present vestry hall) and the north side of Kensington-gardens; but it will be more correctly pointed out by my stating that the said old relic stood on a slanting grassy bank about 100 ft. distant from No. 4, Craven-hill, at the back of the line of dwelling-houses now bearing that name. It was erected and, up to the year 1798, and nearly

twenty-three years later, was kept up by the Corporation of London, 'to preserve a large spring of pure water which rose at the spot, and was formerly conveyed by leaden pipes (cast in Holland) to Cheapside and Cornhill.' It was one of the most ancient springs in the vicinity of London, and being situate in a manor once belonging to the Sanford family, and subsequently to the Earl of Craven, was granted to the citizens by one Gilbert Sanford in the 21st year of the reign of Henry III., A.D. 1236. Reference is made to it in Lysons's 'Middlesex,' p. 331; also in Pennant's 'London,' and Stowe's and Marshall's records. I drank of the little rivulet in the year 1804, and recollect perfectly the haystack-shaped monument overshadowing the stone pipe from which it issued, the security of which was threatened by the roots of a very old pollard elm. It exists no longer. When the Craven-hill estate was parcelled out for building purposes this stone conduit-house was pulled down, and the stream was led either into the main sewer or into the River Serpentine, which rises much further up in a north-easterly direction, and now rushes, occasionally with great impetus, under the centre of the roadway in Kensington-garden-terrace, close to my own residence, and, crossing the Bayswater-road, enters into Kensington-gardens where the fountains are. A stone tablet on the south side, exhibiting the City of London shield of arms, bears a date 1782—doubtless a period at which repairs were made. A plain stone tablet over the pointed arched door is inscribed with 'Repaired 1637.'"

THE TEES CONSERVANCY WORKS.

THE members of the Cleveland Institute of Engineers, to the number of about eighty, on Monday, the 23rd ult., had an excursion down the Tees, in compliance with an invitation from the Tees Commissioners and the Diamond Rock Boring Company, for the purpose of inspecting the blasting operations being carried on at the Eighth Buoy Scarp, a reef of rock lying right across the bed of the Tees. Steaming down the river, the various improvements effected by the commissioners were pointed out. They landed, and inspected the sea-wall of concrete, which is being formed for the purpose of protecting the breakwater towards the sea. Here Major Beaumont delivered a lecture on the Diamond Rock boring apparatus, giving an account of the various modes of removing rocks. It may be mentioned in passing that Major Beaumont's apparatus is at present being used in boring for salt in the rocky strata near to Port Clarence, on the northern side of the Tees. The buzzer from the barge announced that they were ready for blasting, upon which the party returned to the scene of operations, and witnessed the firing of the holes which had been bored. Within the time the party had left the barge until they returned—being about 3½ hours—nineteen holes had been drilled, each 7 ft. 6 in. in depth. The whole of these went off in the form of seven audible explosions. The holes were 10 ft. apart from each other, so that about 100 square feet of rock was shivered to atoms to a depth of 7 ft. 6 in. The rock thus exploded is removed by a bucket dredger, which takes the place of the barge. After witnessing the explosion the party returned to the ferry landing at Middlesbrough, whence they had started.

ST. JUDE'S CHURCH, SOUTH KENSINGTON.

ONE of the large windows in the south transept of this church, of which we gave illustrations some time ago,* has lately been filled with stained glass, the gift of a member of the congregation. It consists of six lights with elaborate tracery in the head, and contains figures of the Apostles SS. Peter, Andrew, James the Great, John, Philip, and Bartholomew. Beneath each of these is a group illustrating an incident in the Apostle's life, with an appropriate legend. Thus, St. Peter released from prison by an angel, St. Andrew going to martyrdom, the martyrdom of St. James, St. John leaning on our Lord's breast at supper, St. Philip bringing the loaves and fishes to our Lord to feed the multitude, and St. Bartholomew's prayer under the fig-tree. The figures are inclosed in a border of rich foliage broken by numerous figures of angels bearing musical instruments, censers, &c., and in the tympanum our Lord is represented seated on His Mother's knee and adored by angels. The window, which deserves praise, is from the studio of Messrs. Lavers, Barraud, & Westlake, who have four others in progress for the same church. Should the remaining transept windows be filled with stained glass at any future time, it is proposed to complete the series of Apostles on the south side and to place the Prophets on the north.

Subscriptions are being obtained to complete the tower and spire; their non-completion is somewhat of a reproach to Mr. Forrest's large and well-to-do congregation.

* See vol. xxviii., p. 547, and vol. xxix., pp. 366, 367.

EXTENSION OF THE BIRMINGHAM EXCHANGE.

OF late the accommodation afforded for the transaction of business inside the Birmingham Exchange has been found insufficient to meet the continually-increasing demand, and a great deal of business has had to be transacted in the street, much to the obstruction of the thoroughfare to the New-street Railway Station.

The Exchange, as it now stands, was erected from the designs of Mr. Edward Holmes. It has a frontage of 63 ft. towards New-street, and of 186 ft. towards Stephenson-place. The style is Gothic, partaking of a Continental character. The main front has a tower 100 ft. high over the centre to the Exchange, and end wings which rise one story above the other portion of the front.

The new building will be constructed of Hollington stone, and it is stated to be so designed as to carry on the lines of architecture of the school, and blend them by a judicious compromise, so as to make the two styles of the school and the Exchange gradually harmonise with each other. The new erection will be of the same height as the school, and will form a sort of wing to the Exchange. The designs have been prepared by Mr. J. A. Chatwin, architect, Temple-street; and the contractor is Mr. B. N. Smith, builder, of the Crescent.

A PRETTY SAMPLE OF A CHURCHYARD.

INTERFERENCE is seriously needed at Talland, West Looe, Cornwall, for, according to the statements of the Rev. H. Mayo, vicar of Talland, his churchyard is the last resting-place of over eight thousand bodies, interred in little more than half an acre of ground. The usual depth of grave is about 4½ ft., deeper graves being impracticable, owing to the friable quality of the earth, and to its being continually turned over by the sexton.

There are no spaces between the graves, and whenever a person has to be buried, the remains of others have, of necessity, to be disturbed. The gravedigger adopts a scientific plan of finding out whether he will be safe in opening any particular spot, by driving down a long iron tester to the requisite depth, and if this bar only goes through some decayed coffins and "old mortalitys," then that spot is selected by the sexton as suitable for a "new-comer," and it may be that a grandchild's bones mix with its grandmothers, or no relatives whatever.

These repeated burials have raised the soil to such an extent, that the old church is almost at the bottom of a charnel pit; and the vicar declares that the polluted atmosphere arising from the putrid dead renders the sacred edifice unfit for public service. There is, he says, constantly oozing from the graves in the higher part of the yard a horrible slime, which came on the floor of the belfry, and he is obliged to keep disinfectants and brandy for the safety of the ringers. Fresh primroses and exotics, which were gathered and placed in this delightful mausoleum, for church decoration, on Easter Sunday, were almost black in a few hours, and chemists had given their opinion that it was owing to the presence of sulphuretted hydrogen in the atmosphere in such quantities as to endanger human life. On Ash Wednesday, so fœtid was the air in the church, that the congregation was obliged to withdraw. Only last week, the vicar says, he saw a poor woman beside a newly-opened grave weeping bitterly, because the remains of one dear to her had been ruthlessly exposed.

Knowing all this abomination, the vicar of Talland called a vestry meeting of the Cornishmen of East and West Looe, and entreated of his parishioners to form a burial board; the ratepayers, however, were determined to spend no money, and defeated the vicar's proposition.

If this meet the eye of the Home Secretary, it is to be hoped he will use a Cornish refrain, and at once learn "the reason why" this horrible graveyard is not closed. Decency and public health call aloud for the removal of so great an evil.

NEW JEWISH SYNAGOGUE, BRIGHTON.

THE new synagogue in Middle-street, Brighton, is rapidly approaching completion, and will be consecrated on September 23rd, by the Rev. Dr. N. M. Adler, Chief Rabbi. The structure is in the Byzantine style, the materials employed being Chichester brick and stone. The lower portion of the front is formed of three blocks. The central block forms the principal entrance, over which are two circular-headed windows, arched with coloured bricks; and similarly built windows are inserted in each of the outer divisions. The entrance-hall, paved with coloured tiles, is immediately connected with the ground floor of the synagogue, whilst a spacious staircase, on the right-hand side, leads to the gallery and the committee-room. The ground-floor, as usual, is devoted exclusively to the male worshippers, whose seats are ranged longitudinally under the gallery; the inner area, which is covered with black and white marble, being occupied by the reading-desk, &c. At the eastern end is the sanctuary, the approach to which, reached by two white marble steps, is semicircular, and inlaid with mosaic work, the sanctuary itself being guarded by rosewood doors, the sombre tint of which is relieved by gilt beading. Scagliola columns, with capitals of carved stone, stand on both sides, supporting a block of stone, on which is inscribed, in Hebrew characters, "Know before Whom thou standest," the whole being surmounted by a fanlight of coloured glass. Above this are two windows, which will be filled with amber-tinted glass, on which, in white letters cut out with chocolate, will be the Ten Commandments. Under the galleries on each side of the sanctuary is a semi-headed window, with lapis-lazuli columns; and one portion of each will be filled with white marble, on which will be inscribed the prayer always used in Jewish synagogues for the Queen and Royal Family, one inscription being in Hebrew and the other in English. The gallery (for the ladies' use) is supported by iron pillars, painted in imitation of marble, their capitals being decorated by wreaths of acorns, figs, cacti, &c., of stamped iron, heavily gilt, each wreath being of different character. The gallery columns are of a like construction, the front of the gallery being of cedar. The windows are circular-headed, and glazed with rough plate cathedral tinted glass, arranged in geometrical design. The artificial lighting will be effected by sun-burners. The synagogue, which is estimated to cost (including site) some 12,000*l.*, will accommodate 500 persons. The ground floor and gallery each contain about 250 seats, which are of open-pew shape, fitted with lockers, and made of stained deal. The building is about 62 ft. in length, is 40 ft. wide, and about 42 ft. in height. The architect is Mr. Lainson, and the builders are Messrs. Cheesman & Co., of Brighton and Uckfield, whose foreman of the works is Mr. Hampton. A house for the minister, together with schools for boys and girls, have been erected in the rear of the principal structure. The decoration of the synagogue was undertaken by Messrs. Sendall & Son, Duke-street; the heating arrangements by Messrs. Packham & Son, Western-road; and the gas-fittings were supplied by Messrs. C. & J. Reed.

STATUE OF THE CONQUEROR AT FALAISE.

ROCHET'S statue, which, according to your paragraph of last week, is "to be erected," has really been erected in the Place de la Trinité for many years, probably since its execution, which you mention, in 1851. It may be that they are now going to give it a new site or a better pedestal.

It is worthy of notice as a rare instance of an equestrian statue in which the rider is looking to the rear, a point which occasioned some criticism in the case of Foley's statue of Lord Clyde. It is a ponderous affair, and in spite of its fine modelling (said to be founded, as regards costume, on the Bayeux tapestry) gives one the feeling that horse and man are labouring under a heavier load of flesh and accoutrements than they can well bear. THOS. BLASHILL.

THE GUINNESS TESTIMONIAL.

The statue of the late Sir Benjamin Lee Guinness, bart., intended as a memorial of his munificence in restoring St. Patrick's Cathedral, Dublin, has now been completed and placed in the position assigned to it within the railings in front of the southern or principal entrance of the cathedral. The statue, which is the work of the late Mr. J. H. Foley, is of bronze. It represents the lamented deceased in a sitting posture. The attitude is easy and graceful, and the likeness is good. The figure, which is a little more than life-size, rests on a pedestal of Aberdeen granite. The pedestal has been erected by Messrs. Sibthorpe & Sons, of Dublin. The cost of the statue was 1,000*l.*, and of the pedestal, 100*l.*

THE NEW FOREST.

The report of the Select Committee which was appointed in the early part of this year to inquire into and report upon the present condition of the New Forest, with especial reference to the vexed question as to the right of the Crown to resume portions of it for the purposes of plantation or enclosure, has just appeared. It forms a bulky volume of nearly 280 pages, and will be found to contain some curious antiquarian matter relating to the early history of this tract of land, which, as is well known, was desolated by William the Conqueror in order to form a royal chase, when Winchester was still occasionally a royal residence. It appears to have remained in the same wild state in which the early Norman sovereigns had left it down to the reign of Charles II., when, in order to repair the destruction of trees consequent on the licence of the civil wars, it was found necessary to plant a great supply of oak-trees, lest there should be no timber for the "wooden walls" of old England. The first resolution finally agreed upon and embodied in the report to the House is to the effect,—"That the New Forest shall remain open and unenclosed except to the extent to which it is expedient to maintain the existing right of the Crown to plant trees."

CARLISLE AND ITS DEATH-RATE.

The *Carlisle Journal*, in a leading article on the sanitary state of the Border city, points out that the death-rate of what may be called the urban district of Carlisle during the last quarter reached the high figure of 28·4 per thousand. True, there has been an epidemic of measles, but the *Journal* cannot acquit the Urban Sanitary Authority of all blameable share in the excessive death-rate of the district; because the fever epidemic with which the Urban Sanitary Authority dallied so long still shows its black mark upon the return, and the recent fresh outbreak—happily once more reduced to small compass—seems to indicate that the stringent precautions which were for a time in force have been somewhat relaxed.

A NEW ART EXHIBITION.

The Royal Aquarium Company at Westminster are about to invite artists to send pictures and sculptures for exhibition there, and, as inducements, they propose to offer the Society's gold medal and 100*l.* for the best oil painting exhibited; the gold medal and 50*l.* for the best water-colour drawing; and the gold medal and 50*l.* for the best statue. Other medals will also be placed at the disposal of the committee, who are to be appointed to make the awards, and 3,000*l.*, it is stated, are to be distributed amongst the season-ticket holders by a sort of art-union. It might be thought that the attractions of the institution would suffice, at all events in the first instance, to draw the public, and that the promise of prizes might be kept for a later day.

Saw-Mills in Chichester.—The saw-mills recently erected by Mr. W. Johnson on his premises in St. John-street, are now in full work, and will supply a want long felt in the neighbourhood. We understand that the machines now put down, comprising both vertical and circular saws, form but the first portion of those intended to be erected. They are driven by a powerful horizontal engine, supplied by steam from two large Cornish boilers. The machinery was put down by Mr. Buchan, of the Caledonian Ironworks, Chichester.

INJURIOUS COMPETITIONS.

Sir,—In the advertisements of competitions in the last number of the *Builder*, are two examples, more flagrant than usual, of the degradation into which the competition system is likely to fall. The first is from the Skenfrith School Board, Monmouthshire, who invite *tenders* (evidently assessing architects' brains at so much a pound) in competition from architects "to be sent to their clerk before the 3rd of September next, stating in a lump sum their charge for preparing plans and specifications," and so on. The last sentence of the advertisement says:—"The Board do not pledge themselves to accept the lowest or any *tender*." In fact, the Board want to obtain high talent at the cheapest price, and I wish they may get it. But the advertisement preceding it is perhaps worse. "To Architects. Mr. S. Brooks invites specimens of plans from the above for the erection of a modern detached villa, at Pilesthorne. Mr. S. B. does not bind himself to accept the lowest or any plans.—For full particulars, apply to Mr. Bettle, Chemist, Fore-street, Wellington, Somerset."

What is the use of talking about the dignity of the profession when a public board and a private individual evidently have such a low opinion of architects in general? Still, I fear there may be some who will respond to this "liberal" appeal from possible employers. But my principal object in writing this letter is to urge the necessity of some immediate action being taken in respect to this miserable competition system. The subject has not come within the scope of the recent Special Committee on the affairs of the Institute; but when reforms are talked about, the present is a favourable time for considering *competitions*. I should also hope ere long to see some readjustment of the scale of professional charges for such works as church reparations involving small expenditure. The remuneration of 5 per cent. for the labour involved, and the great skill and experience required to really restore an old church, is wretchedly inadequate; 10 per cent. would be nearer the mark. I should add that I am no interested party in competitions, never having had the enterprise to engage in them. Edmund B. Ferrey.

THE POPULATION OF TYNDALL'S BUILDINGS.

Sir,—In reply to Mr. Isaacs' letter on the population of Tyndall's-buildings, I frankly admit that gentleman's general arguments as to the difficulty of ascertaining the exact population of any given place, and to the variable numbers from time to time, but these circumstances do not alter the facts in question to any material extent.

The main points are that we stated the population of Tyndall's buildings to be 321, and Mr. Isaacs stated it to be 608, an excessive discrepancy.

On the 17th of August our superintendent made a night census, in accordance with Mr. Isaacs' suggestion, and he reports that he found not one more sleeping in the buildings than his weekly return shows, viz., 323 persons in nineteen houses. He adds that in Nos. 11 and 12, lodging houses for single men, where there are thirty-three beds, there were only twenty-five inmates. Our figures are thus fully confirmed.

As regards the special instance in which Mr. Isaacs cites the numbers and ages of a family (the O'Donnells) occupying the ground floor of "No. 1," this is no doubt a case of overcrowding, which it would have been better to have avoided. This family came in on the 14th of June, and misrepresented their numbers to our superintendent. We should be glad to determine the tenancy at once, but the mother being paralytic, we shall be unable to do so until time has been allowed to procure another lodging. There will be, however, no avoidable delay. I may state that there is another family in the buildings which has outgrown the accommodation, but who have been our tenants for many years. This family is, notwithstanding, under notice to quit.

These are incidents that are certain to occur in the management of this class of property, and it is this constant liability that creates the necessity for our superintendence.

Our President, Lord Shaftesbury, always manifests a lively anxiety that our instructions in respect to overcrowding should be strictly observed; and it is much to be regretted, whenever, from unexpected circumstances, his wishes cannot be carried out.

In this matter, moreover, we are subject to the supervision of the officers of the local authority, and we are at all times glad to receive notice of any case of overcrowding that may come to their knowledge. In this instance no notice has been given except in the form now adopted by Mr. Isaacs. We cannot be in any way answerable for overcrowding in Gray's-inn-road.

With respect to the general management of Tyndall's-buildings, I have much pleasure in quoting a sentence from a letter dated July 24th, and addressed to me by Dr. Gibbon, the Medical Officer of Health for the Holborn District. That gentleman says:—"I still gladly testify to the excellent sanitary administration of this court." Charles Payne, Secretary.

Society for Improving Condition of the Labouring Classes.

WHO LOOKS AFTER BEDFORD STREET?

Sir,—Permit me to inquire if there be any surveyor, parish or otherwise, in charge of Bedford-street, Covent-garden, and its neighbourhood? On Monday last holes were made in the roadway leading to Garrick-street, with the utmost complacency by a party of (probably inspired) working men; and not even a policeman appears to have been consulted thereon. They were closed towards three in the afternoon, when other holes were made in the pavement, and some of these were left unguarded, to the astonishment of other wayfarers besides myself, who nearly fell into one. Of course I am delighted to see the improvements gradually being effected in London, and will not complain when an old house, which would tumble down of its own accord, if permitted to do so, requires several months to completely demolish and dispose of to the "old clo'" portion of the building community. The dust that is thereby generated tickles and does not annoy me. But I think those who are compelled to live within earshot of the carters and nose-scent of the carts that for long hours thrice a week block every original thoroughfare to Covent-garden, have a right to complain when even the footpaths are taken from them by speculative builders, who pull down but do not rebuild, and who offer no better excuse for the fact than a huge notice-board, which informs the passers-by that premises suitable to a public company will be one day erected upon this or that site provided application be made to a certain Mr. Howard. At the corner of Bedford and Chandos-streets a hoarding has existed for at least eight months. It is placed upon the footpath so that no one can walk upon the narrow strip of stone which remains. No apology even for a building seems to be yet contemplated; and this waste piece of land, like other waste bits upon this portion of the Bedford estate, is a mere receptacle for animal and vegetable matter. Please raise your voice, Sir, against a similar state of things, and, at the same time, supplement the indignant protest lately made by "Bedford Street" in the *Times* regarding the barbarous character of London underground. W.

HEIGHT OF ROOMS.

Sir,—In reply to a letter in the *Builder*, signed "A Surveyor," regarding the power of local authorities over the heights of rooms, I beg to state the result of my experience has been quite contrary to that of "A Surveyor," as nearly all the authorities which I have known have had a by-law regulating the height of rooms intended for habitation. The authority with which I am at present connected has only been in existence a little over two years, and our by-laws, which have been duly approved and sanctioned by the Local Government Board, contain restrictions regulating the height of ceilings, and which are enforced in my district.

A Surveyor to a Sanitary Authority.

*** The fact, as already stated, that by-laws for regulating the height of rooms are held to be *ultra vires*, as they are not within the application of the statute (which authorises by-laws as to *ventilation*) is, we believe correct. The explanation of such a regulation having been confirmed by the Local Government Board, as mentioned above, probably is, that it was submitted to the Local Government Board shortly after the power of confirming by-laws was transferred to that Board, and before they had departed from doing precisely as their predecessors had done.

NIGHTLY LODGINGS.

SIR,—I see by an article in the *Advertiser* of Saturday, August 11, that the Peabody Trustees contemplate purchasing the greater part of South Bloomsbury. They are said already to have purchased the ground-rent of the area enclosed by Prince's-street and Duke-street, Great Queen-street, Drury-lane (from Prince's-street to Great Queen-street), and on the east from Duke-street to Great Queen-street. May I suggest that, in erecting the new dwellings, that due consideration be given to the wants and necessities of the large class of persons who pay nightly. This class of unfortunates has hitherto suffered rather than benefited by the changes which have been wrought. Such persons do not consist wholly, as you are aware, of vagrants and tramps; it includes many who are simply under a cloud, and who are striving and hoping for better times. I have known many who have been forced temporarily into the lodging-houses about to be removed who were gentlemen in everything save their purses. Cannot the Peabody Trustees, in their contemplated new dwellings, occupy a portion of the site in which men with proper credentials can be accommodated in a way that will lessen the amount of misery entailed upon them by the misfortunes under which they temporarily labour?

A FRIEND IN NEED.

FALSIFICATION OF ACCOUNTS BY A BUILDER'S FOREMAN.

AT the Middlesex Sessions, on the 24th ult., Frederick Burns, foreman to Messrs. Colls, builders, was convicted of falsifying certain time-sheets, and thereby defrauding his employers. He was brought up for judgment on 26th ult., when Mr. Hamilton, the manager to the prosecutors, was called, and stated that the prisoner's honesty had been doubted for some time, but he had only looked into his last week's accounts. He believed these robberies had been going on for more than three months. The Assistant-Judge sentenced the prisoner to hard labour for eight months.

GRINDING MONEY AGAIN.

AT the Lambeth police-court last week, Mr. B. E. Nightingale, builder, of the Albert Works, Kennington, was summoned for refusing to pay to the complainant 9d. for one hour's grinding money, due to him as wages.

Mr. Hicklin (Messrs. Hicklin & Washington) appeared for the complainant, and stated that the question really was whether men employed in the building trade should have two hours' notice for grinding tools on their discharge. Mr. Brydges had given a decision in favour of the men, and so had Mr. Woolrych.

Mr. Chance asked how it would be if a man was engaged for a day. Would he then require to have two hours' pay for grinding money?

Mr. Hicklin contended he would be entitled to have it. The edges of the tools used by him would be taken off, and he would require time to have them placed in a condition to work with before he could go on other work.

Mr. Chance said under those circumstances if a man was employed each of the six days by different masters he would have twelve hours' pay also for grinding his tools. Was he (Mr. Chance) to understand that if a man was engaged one hour for a master, and then discharged, that he was to be entitled to two hours' money for grinding his tools?

Mr. Hicklin contended that he would, unless a special bargain was made.

William Gordon, the complainant, said he was a carpenter and joiner, and was engaged by the foreman in the shop. No one called his attention to any rules placed up in the shop. Nothing whatever was said to him about such rules.

Mr. Hicklin pointed out that the question as to grinding money was settled in July of this year at a conference between deputations of the carpenters and joiners of London and the Central Association of Master Builders. All masters were invited to attend that meeting, but a large number did not attend.

George White, shop foreman to defendant, said the complainant was taken on to work according to the rules of the firm. Those rules were placed upon the walls, and one of them specified that one hour's notice only would be allowed to collect and sharpen tools when discharged. He could not say that complainant had his attention called to such rules when he was engaged. When discharged, he was paid one hour for grinding money, and many of the large firms gave no more.

Mr. Chance said that might be, but it must be proved that he had read the rules. The safest course for firms who had rules would be to point them out to men when first engaged. Masters had a perfect right to make rules for conducting their several establishments. He strongly advised that masters or their foremen, when engaging men, should point out these rules. He should order the payment of the additional one hour, but no costs beyond the amount for the summons.

The Berwick-upon-Tweed Surveyorship. Mr. Jas. Lawrie, Edinburgh, has been appointed surveyor, &c., to the Urban Sanitary Authority of Berwick-upon-Tweed. There were forty-three candidates for the office. The salary is 140*l.* per annum.

LAWSUIT AGAINST A SURVEYOR FOR TRESPASS.

LIPTROT *v.* NICHOLSON.

THE plaintiff in this action, in the Wigan County Court, is a farmer, and the defendant is assistant-surveyor to the Pemberton Local Board. The claim was but for 5s. alleged wilful damage done to crops in a field. Two counsel were engaged, and at the opening of the case Mr. Peace, for the surveyor, objected to the jurisdiction of the Court, on the ground that the Railway Clauses Consolidation Act, 1845, which was incorporated in the Pemberton Local Board Act, provided that the compensation for damage done when levelling and surveying for the purpose of the Act should be settled by the justices of the peace.

The Judge, Mr. Ffoulkes, said before deciding the objection he should hear the evidence.

Witnesses were called, who proved that the defendant and a boy were in a field of the plaintiff's on June 18 last, and drawing a surveyor's chain along a potato bed, and committed damage to the amount claimed in the summons.

The defendant stated that he was merely surveying the land in connexion with the Pemberton waterworks, that the survey was performed in an ordinary and proper manner, and that no unnecessary damage was committed.

The learned Judge said the plaintiff sued for a trespass committed by the defendant in bringing a chain across his potato-field, by which he damaged the crop. Assuming that the surveyor had no right to enter the field, the claim was no more than the damage sustained; but the surveyor relied upon a local Act, which incorporated, among other Acts, the Waterworks Clauses Act; and under the 12th clause of that Act the surveyor was empowered to go upon the plaintiff's land and take the necessary surveys and levels, for the purpose of constructing waterworks. The Act further provided that compensation was to be given for all damage done in the execution of the work; but under the Railway Clauses Consolidation Act they were required to go before the justices to recover the compensation. The only claim the plaintiff could bring in the County Court was for wilful trespass, which was not done strictly in the execution of the work. He could not say he understood much of surveying with the chain, but he knew something of military surveying, and it was a fact that the person surveying did not wish to disturb the chain while the measurement was being taken from point to point. The evidence of the defendant seemed to him to show that he only did what was proper in carrying on his survey, and the plaintiff did not show that the surveyor did anything else. His judgment would be for the defendant, and he should order the plaintiff to pay costs.

VARIORUM.

The *Technical Educator* says, as to the gates of canal locks:—The timbers forming the gates of locks will vary in size according to the dimensions of the opening, and their respective depths below the water-level, the lower rails having to support a greater pressure than those above. The weight of water supported by each horizontal rail will be found by multiplying their length, the interval from one to the other (usually 38 in. from centre to centre), the height of the water above the centre of the rail, and the product by 62 lb. (the weight of a cubic foot of water), the last product of these measures giving the number of pounds which the rails ought to support throughout their whole length. For small gates, the timbers or rails may be from 4 in. to 5 in. square, and for larger, from 7 in. to 8 in., the latter being sufficient for a fall of 10 ft. 6 in., with a width of 17 ft. between the hanging-posts, six rails being put in the height. Whilst, on the one hand, it is desirable to have an excess of strength above the calculated requirement, it is, on the other hand, undesirable to make this excess excessive, as so much more weight is injurious to the supporting collar and the masonry to which it is attached. The diagonal direction of the braces may be dispensed with by the substitution of a bar of iron placed diagonally from the supporting collar to the lower end of the shutting-post. The escape of water through the gates must in every way be guarded against. It is very difficult, indeed almost impossible, to prevent its escape through the joint of the shutting-posts, because of the difficulty of making them touch throughout their own length. To obviate this, they should be cut in a circular form,—one concave and one convex. The curvature should be with a radius of about 12 ft. The rails are mortised into the uprights, and are further strengthened by strong angle-irons and T-pieces.

——Cassell's *Family Magazine* gives a useful hint as to how to clean a window. It seems a simple thing to clean a window, but in truth all those who essay do not succeed, for the glass looks dim and streaked afterwards, instead of being bright and clear. Do not tell me that this failure is owing to the quality of the glass, for, excuse me, it is not. I suspect that the window-cleaner is not up to the work. I should imagine that the boy or the maid has plunged a washleather into a bowl of water, and soused the panes, with an idea that that process was the proper one. It is this error of rubbing a very wet leather over dusty glass which causes the effect one so often sees. Let a duster be first used, and when the glass is tolerably free from dust, then let a damp washleather remove all specks and spots, and lastly, let a soft dry cloth give the finishing rub. The windows will then reflect a proper amount of credit, and will cheer the passers-by with their bright, sparkling panes.

——The *Daily Recorder* says:—"From present signs, the building trade seems likely to receive a large and constant development from the carrying out the Artisans' Dwellings Improvement Bill. Already the Town Councils of the great manufacturing towns have announced their intention to carry the measure into extensive operation. Corporations hitherto prevented by lack of funds from emulating the action of London now find themselves empowered, under the provisions of this Act, to raise sufficient means for public improvements known to be ultimately profitable. The planning and the surveying have for the most part been already executed; so that, one half-year being given to settling the purchase, clearing the ground, excavating foundations, and the many small but important matters that are not seen above ground, the actual business of building will commence briskly with the next spring, and a general move onwards and upwards take place in almost every trade, consequent on so large an outlay, amounting to several millions. At this period much will depend on the action taken by the working men connected with the building trade in its various branches. For now six years past that trade has been flagging, and almost brought to ruin by a succession of perverse strikes, the unions altogether refusing to recognise the falling off in demand and the rise in material."

Miscellanea.

Hardened Glass.—Messrs. Powell, of Whitefriars, who are experimenting on this process, say:—Hardened glass is not "unbreakable," it is only harder than ordinary glass, and though it undoubtedly stands rough usage better, it has the disadvantage of being utterly disintegrated as soon as it receives the slightest fracture; and up to the present, until broken, of being undistinguishable from ordinary glass, unless a certain pink tone noticeable in hardened flint glass can be taken as an indication. This glass is known as "toughened" glass, and we have seen the terms "malleable" and "annealed" applied to it. Nothing can be more misleading than these unfortunate epithets. The glass is hard, and not tough or malleable, and is the very opposite to annealed glass. Annealed glass is that the molecules of which have been allowed to settle themselves: the molecules of hardened glass have been tortured into their position, and until the glass is broken, are subject to an extreme tension. It is the sudden change of temperature that "hardens"; glass heated up together with the oil may be annealed, but decidedly is not hardened. A piece of hardened glass is only a modified Rupert's drop, *i.e.*, it is case-hardened; the fracture of both is identical, both resist the diamond, and both can be annealed. Moreover, in the middle of imperfectly-hardened glass, a line is plainly visible, which seems to mark the extent of the case-hardening. This line resolves itself, under the microscope, into a mass of bubbles and striæ, it seems to be the nucleus of breakage, and consequently, as soon as the cutting-wheel approaches it, utter destruction ensues.

The Ely Local Board of Health Surveyorship.—At the meeting, on the 25th ult., of the Ely Local Board of Health, part of the business related to the appointment of a surveyor, Mr. G. Mather (son of the late surveyor) having offered himself as a candidate for the vacant office. The late Mr. Mather occupied the position of surveyor for the City of Ely for twelve years, commencing at a salary of 120*l.* per annum. This sum was subsequently increased to 150*l.* The question now arose as to Mr. Mather's eligibility for the vacancy; and it was pointed out that he had for years been engine-driver under his father at the Angel Works; that he had acted as his father's deputy; that in some respects he possessed qualifications superior to those of his father; and that he had given satisfaction in the performance of his duties. It was stated that he was now the landlord of the Dolphin Inn; and he had signified his intention to give up the inn if he should be appointed to the vacant office. The Board did not come to any decision.

The New Law on Land Titles and Transfer.—This important statute, among the last passed on the day of the prorogation, has just been issued. It makes further provision for the simplification of the transfer of land in England. There are 129 sections in this Act, which is to come into operation on the 1st of January next. It is divided into five parts, each containing numerous provisions on the following subjects:—1. Entry of land on the register. 2. Registered dealings with registered land. 3. Unregistered dealings with registered land. 4. Provision supplemental to foregoing parts of the Act. 5. Administration of the law and miscellaneous. A land registry is to be established, and any person may apply to be registered under the Act as to freehold land, provided that in case of land contracted to be bought the vendor consents to the application. A separate register is to be kept for leasehold land, and certain persons may apply for registration. There are numerous provisions in the several parts, and a land registry is to be created and officers appointed by the Lord Chancellor. The present land registry, it is understood, will be utilised with the staff of officers, and they may be appointed and new rules framed at any time after the passing of the Act, but not to take effect till the 1st of January next. The further provisions now made to simplify title and facilitate the transfer of land are of a permissive character, and may be adopted.

Sanitary Matters in Spain.—A correspondent of the *Morning Post*, describing the siege of Seo de Urgel, has something to say on the sanitary condition of the place. He says that although crammed with soldiers to overflowing the place is perfectly healthy: this is due, no doubt, to the mountain air and dry atmosphere. When the refuse left in the middle of the street to rot, *à la mode Espagnole*, becomes offensive, a very simple process is adopted by the authorities to remedy it: a torrent of water is let out through the streets from the irrigating canal constructed many years since to water the fruitful valley in which the place is situated. The Spaniards are more Arabs than Europeans in their dwellings, and have not the slightest idea of taste in the exterior or interior of their homes. The climate renders it unnecessary for them to make use of paint as a preservative for the woodwork of their houses; consequently, when once they are built they become more and more begrimed every year, and as no new house appears to have been built in this town for the last two or three centuries, it is easy to imagine what the state of them is. The inhabitants—even those of the better class—partake of the character of the houses, and appear never to change their garments.

Dynamite.—The increased amount of work done with dynamite as compared with either gunpowder or gun-cotton has frequently been noticed, but the precise relative economy of the several explosives is, perhaps, less generally known. The St. John del Rey Mining Company, during the last two months of 1870, when they were sinking the two new shafts, sunk with gunpowder 10 fms. 2 ft. 4 in., at a cost of 68*l*. 3s. 6d. per fathom; during the following two months they sunk with dynamite 20 fms. 8 in., at only 43*l*. 14s., so that double the work was done, and there was a saving of 24*l*. 9s. 6d. per fathom. The contractors for the railway tunnel under Clifton Downs used gunpowder, gun-cotton, and dynamite successively,—the boreholes being drilled by machinery to the same dimensions and depth,—and the results were that 756 lb. of powder drove 8 yards, thirty-one shots per yard forward being put in; and 169 lb. of gun-cotton drove 14 yards, eighteen shots per yard being put in; and 165 lb. of dynamite drove 15 yards, seventeen shots per yard forward being put in. For driving 15 yards forward, estimating powder at 5d. per lb., and gun-cotton and dynamite at 2s. per lb. each, it would cost 29*l*. 10s. 7d., with powder, 18*l*. 2s. 2d. with gun-cotton, and 16*l*. with dynamite. The saving in time is even greater than the saving in cost.

Sadlers' Wells Theatre.—At the Mart, Tokenhouse-yard, among the sales announced for Tuesday last was the lease of Sadlers' Wells Theatre, which was described as being held for an unexpired term of thirty-six years from Midsummer last, at a ground-rent of 277*l*. per annum, and the estimated rental value of 1,000*l*. per annum. The theatre was withdrawn at 1,020*l*., the auctioneer remarking that he expected to have got 3,000*l*. for it.

New Goods Depot, Farringdon-road.—The new goods station which has been for some months past in course of construction in Farringdon-road, is now nearly completed. It belongs to the Great Northern Railway Company, and will cost upwards of 100,000*l*. (exclusive of land). It will be one of the largest railway goods depôts in England, covering an area of 25,000 superficial yards, or rather more than five acres. The site, which is on the west side of the Farringdon-road Station, was purchased from the Metropolitan Railway Company, and junctions have been effected with that portion of the Metropolitan Railway used by the Great Northern, London, Chatham, and Dover, and Midland Companies. Much engineering skill has been brought to bear, and the whole of the retaining wall in Farringdon-road, from the middle-level sewer to Charles-street, has been underpinned. In clearing the earthwork down to the rail levels, upwards of 55,000 cubic yards of soil have been removed. For the foundations of the basements of the piers it has been found necessary to go much below the rail levels, owing to the shifting nature of the ground. Extensive warehouses, built by Messrs. Kirk & Randall, of Woolwich, rise on piers, arches, and columns from the railway level below.

Northampton Operative House Painters' Society.—This society, which is in amalgamation with the General Alliance of Operative House Painters, the head-quarters being at Manchester, held its anniversary on the 21st ult. The Northampton society has now been in existence some eight years, and has been uniformly successful. It numbers at the present time some sixty paying members, with a correspondingly good state of funds. Fresh benefits have lately been added, by which the relatives of a member meeting with a fatal accident while occupied at his trade are entitled to the sum of 10*l*. from the Alliance, and a further 4*l*. from the local society. It has been the custom in former years to hold the annual dinner at the club-house, but this year the committee determined upon holding it at the Melbourne Gardens, where exactly fifty members sat down to dinner. The number of societies in connexion with the General Alliance was said to be upwards of seventy, containing upwards of 7,000 members.

Mr. Poynter, A.R.A.—Although Mr. Poynter has been appointed Inspector-General of Schools of Art in place of Mr. Redgrave, he will (according to the London correspondent of the *Birmingham Daily Gazette*) continue to hold his Slade professorship at University College. He delivers his introductory lecture on October 5, and the classes for drawing, painting, and sculpture will begin on the following day. Those who want to attend these lectures should apply at once, for of late the accommodation has proved quite unequal to the demands made upon it. Mr. Felix Slade, who founded this professorship, founded also six scholarships of 50*l*. a year each, tenable for three years, for proficiency in drawing, painting, and sculpture. Two of these scholarships will be awarded in 1876, and the conditions of competition are, that the competitors must have entered the Fine Arts Class at University College before November 16 next, and not be more than nineteen years old next June.

The Prout Memorial.—Mr. Dillon Croker has given two readings in aid of the Prout Memorial Fund at the Royal Cork Institution, and greatly pleased his audience. The chair was occupied by Richard Caulfield, esq., LL.D., who introduced Mr. Croker in a few brief remarks. At the time of the commencement of the reading, the bells of Shandon, made ever memorable by Father Prout's well-known stanzas, rang out the time-honoured melody of "The Groves of Blarney," to which air words have been set, and Mr. Croker, meeting the occasion, read the poem with capital effect. The other pieces in the programme included "Nicholas Nickleby at Dotheboys Hall," "Peg of Limaviddy," one of "Mrs. Caudle's Curtain Lectures," &c., all of which were read by Mr. Croker in a manner that proved him to be a master of the art of public speaking of first-class merit.

The City Library, Guildhall.—The City Library, Guildhall, which has been closed since the 22nd of July, was re-opened on Monday last. During the recess it has been thoroughly cleansed and repainted, and the library itself re-organised. The Corporation of the City of London have granted 400*l*. for the compilation of a new catalogue.

Life-saving Appliances.—A very interesting exhibition is announced to take place next year at Brussels, under the auspices of the Royal Humane Society of Belgium, the object being to call into action the ingenuity of all who are willing to enlist in the good cause for the purpose of devising the best possible means of reducing the risks to which life and limb are now exposed. According to the *Rock*, questions of public health and sanitary arrangements are ranged under the fifth class, which also comprises such improvements in connexion with medicine generally as may be considered of sufficient interest to be shown. Industrial operations are, in many instances, carried on under deplorably unfavourable conditions, notwithstanding all that has been done for the workman in this direction, and so the Belgian Society proposes to show what more may be accomplished in the way of getting rid of these evils.

The Sanitary Condition of Hull.—At the last monthly meeting of the Hull Board of Health, held on the 26th ult., Mr. Blackburn called attention to the increasing death-rate of the town, which, he said, was a terrible indictment against the Board. He referred to the report of the medical officer, and condemned the existing sanitary state of things. He blamed the Board for being accessory to the increasing mortality, and declared that without any stretch of the imagination he could hear the wail of the widow and the orphan, caused by the supineness of the Board. They had spent hundreds of thousands in constructing a deep drainage, and he gave notice that at the next meeting he should move that the sanitary committee report upon the propriety of appointing a medical officer in such a manner as would enable him to devote the whole of his time to the duties of the office.

Withdrawal of a Tender.—At the usual fortnightly meeting of the Marylebone Board of Guardians, on Friday last, a letter was read from Mr. H. Saxon Snell, the architect, informing the Board that Mr. Timewell, of 35, Essex-road, Islington, wished to withdraw his tender (1,660*l*.) for building basement story and foundations of the new infirmary wards for men, in Northumberland-street, in consequence of his (Mr. Timewell) having made a mistake in the calculations upon which his tender was based. The Chairman stated that legally Mr. Timewell could not withdraw his tender, but the Board were not desirous of being hard in the case, and he would suggest that the application should be granted, and the 5*l*. deposit money returned. A resolution was adopted embracing the views of the Chairman. The Board then accepted the tender of Mr. Crockett, of St. Pancras, for the sum of 1,849*l*.

Leeds Royal Exchange.—On the 31st ult. the Royal Exchange, Leeds, was opened to the public with a short ceremony, in which Mr. Nussey, chairman of the company who have erected it, took the leading part. The foundation-stone was laid by the Duke of Connaught in September, 1872, on the occasion of his visit to Leeds for the purpose of opening Roundhay-park to the people. The Exchange has been built by a company of merchants and representatives of the iron, flax, leather, machinery, and other trades. The style of architecture is Perpendicular Gothic, the architect being Mr. Waterhouse, whose designs have been carried out by Mr. Healey and Mr. Whiteley. The merchants and manufacturers representing the various industries of the town and neighbourhood attended in considerable numbers.

New Barracks for Richmond, Yorkshire. A correspondent of the *Leeds Mercury* writes that there is now no doubt about Richmond becoming a military centre. The War-office authorities have made arrangements for the erection of new barracks. The contractors for the works are Messrs. Parnell & Son, of Rugby, and it is calculated that a sum of about 100,000*l*. will have to be expended before the works are completed. The site is almost on a level with the racecourse, and is therefore elevated, healthy, and conveniently situated. The ground staked out is nearly fifteen acres in extent.

Carpenters in the Royal Navy.—Mr. J. Filluck, acting first-class draughtsman at Portsmouth Dockyard for the instruction of carpenters of the Royal Navy, has been appointed established first-class draughtsman for the instruction of carpenters of the Royal Navy at Chatham dockyard, *vice* Mr. F. Jago, who has been appointed a surveyor to the Board of Trade.

Another Tombstone Case.—It is not improbable that the public may, before long, hear of another legal case arising out of a dispute in reference to the erection of a tombstone in a parish churchyard. In this instance, however, the stone is objected to on æsthetic rather than on ecclesiastical grounds. It appears that in a mason's yard in the parish of Horsemonden near Staplehurst, there is a stone ready for erection in the parish churchyard, the stone, it is said, being of the form which has been common in English churchyards for centuries. The rector has refused resolutely to have so "hideous" a stone erected in his churchyard, remarking that all stones there have, and must have, upon them the form of a cross. The matter will probably result in an appeal to the Archbishop of Canterbury.

Gas Dividends.—The Brighton Gas Company has declared a dividend for the past half-year at the rate of 9 per cent. per annum as against 10 per cent. per annum in the previous half-year.——The Ludlow Gas Company, at its annual meeting, held last week, resolved that a dividend of 5 per cent. be paid to the preference shareholders for 1874, and that a dividend of 3 per cent. be paid to the original shareholders.——The directors of the Gloucester Gaslight Company recommend that the maximum dividend be declared for the past half-year, viz., 10*l.* per cent. per annum upon the "A" shares, and 7*l.* 10*s.* per cent. per annum upon the "B" shares.——The Barnet District Gas and Water Company have declared a dividend for the past half-year at the rate of 3*l.* per cent. per annum on the "A" stock and shares, and 2*l.* per cent. per annum on the "B" stock.

Slaughterhouses in St. Pancras.—At a meeting of the St. Pancras Sanitary Committee on the 25th ult., Dr. Stevenson, medical officer of health, reported that he had visited one slaughterhouse, where the state of things was truly horrible. The paved approach was thickly coated with soft fœcal matter, and strewed with sheep's heads from which the blood was still oozing. This mixed heap of dung and offal was offensive, and had not been removed for several days. Inside the slaughterhouse the impervious portion of the walls had not been cleansed after slaughtering as required by the bye-laws, but filth had been allowed to dry on them. For some years this slaughterhouse had been the subject of complaint from the neighbours. He recommended a prosecution for infringement of the bye-laws. A motion to institute a prosecution was negatived by nine to seven.

The St. Gothard Tunnel.—An exhaustive and interesting communication upon this great engineering work was read before the recent Geographical Congress at Paris. Up to August 1, 1875, the length of tunnel driven was 4,413 mètres, leaving 10,507 mètres to drive, and the whole must be completed by October 1, 1880. Allowing ten months for the finishing of the tunnel after the ends are joined, the communication should be made in December, 1879, and as the work was commenced in September, 1872, it will have occupied seven years and two months. The rate of progress hitherto has averaged 126 mètres per month; they are now making 230 mètres per month, and this will, no doubt, be increased, whilst 202 mètres per month will complete the work within the time stipulated.

The West Front of Lichfield Cathedral. In a sermon preached on Sunday, the 22nd ult., in Lichfield Cathedral, Dean Bickersteth declared that he contemplated the complete restoration of the west front of his cathedral, under the direction of Sir Gilbert Scott, who restored the interior. As the preacher aptly put it, he desired to do something towards making that which is without worthy of that which is within, and, at all events, to restore the west front according to its ancient features by replacing the Roman cement with good honest stone. The cost of the contemplated work is matter for conjecture, but on the subject being mooted some years ago, it was stated that it would require some 20,000*l.*, an estimate which now-a-days would probably have to be considerably increased.

New Mechanics' Institute for Northowram.—A new Mechanics' Institute at Northowram, which has been erected at a cost of 2,000*l.*, was opened on the 25th ult., by Mr. A. B. Foster, of Northowram Hall. The building contains a large concert-hall, four commodious class-rooms, and committee and billiard rooms. The architect is Mr. Hellewell, of Brighouse.

The Prizes of the Coachmakers' Company.—In the late competition for prizes of the Worshipful Company of Coachmakers and Coach Harness-makers of London, open to the coachmakers of the United Kingdom, and carried out by the examiner of the Society of Arts, the first prize for the technology of carriage building, consisting of the Society's silver medal and 3*l.*, was awarded to Mr. Matthew Mullins, of 42, Maylor-street, Cork (coach body-maker). Mr. Mullins and his brothers, Thomas and Jeremiah, have been diligent students of the Cork School of Art, and their names have been frequently mentioned in connexion with these competitions as having carried off some of the highest prizes offered by the Worshipful Company to the artisans in this speciality of the United Kingdom.

A Cab Show.—An exhibition of metropolitan cabs and cab-horses will be held on the 1st of October at the Alexandra Palace, under the patronage of the Earl of Shaftesbury, the Lord Mayor, the Royal Society for Prevention of Cruelty to Animals, &c. The object is to produce improved cabs, and the movement is, according to the *Daily News*, being supported by the cab proprietors. About fifty prizes, running up to 10*l.*, will be given, and among them two prizes of 10*l.* and 5*l.* are offered to the exhibitor of the best design for a cabman's shelter, to be erected on the cab ranks, at a cost not exceeding 75*l.* Previous efforts in the direction of obtaining improved cabs and cab-horses have not met with much success.

Discovery of Urns at St. Alban's.—In making the excavations for the foundation of some new buildings in the Verulam-road, St. Alban's, the workmen engaged have just dug up a number of ancient urns. They were found to be very rotten, but two have, with care, been tolerably well preserved. The best specimen is an urn made of common clay, 7¾ in. in height, and 8 in diameter. There is no ornamentation except at the mouth, which has an everted lip with two shallow grooves. The almost entire absence of ornamentation renders it somewhat difficult to say whether these funeral urns are British or Saxon, although the balance of evidence is said to be in favour of their being British.

Civil and Mechanical Engineers' Society: Visit to East London Railway Works.—On Saturday last Mr. G. W. Willcocks, president, Mr. R. M. Bancroft, vice-president, Mr. E. H. Brewster, and several members and friends, visited the above works, by the kind permission of Sir J. Hawkshaw, and were shown over by the resident engineer, Mr. Hunt. Great progress has been made since the account of the works was given in the *Builder* some months back. This society is making good use of the summer recess by visits to works on alternate Saturday afternoons, and has already been to the Pumping Station, Grosvenor-road; Royal Aquarium, Westminster; and widening of Chalk Farm Tunnel.

Birmingham.—The ceremony of unveiling the window which has been placed in St. Asaph's Church, Great Colmore-street, as a testimonial to the labours of the Rev. R. Page, M.A., the first vicar of the parish, took place on Saturday last in the presence of that gentleman. The window, which comprises four cartoons, representing four incidents in the life of our Lord, viz., the Baptism, the Call of Peter and Andrew, the Transfiguration, and the Anointing at Bethany, is inclosed in richly-coloured ornamentation, the whole surmounted by tracery representing the emblem of the Lord's Supper. The window is one of four executed by Mr. C. Heritage, of Marshall-street, Birmingham.

The Corporation of Rochester, at a special meeting held on the 24th ult., resolved to instruct the town clerk to institute Chancery proceedings against the Secretary of State for War, and Messrs. Jackson & Shaw (the well-known contractors), for infringing the rights of the Corporation of Rochester as owners and conservators of the Medway. The Government has employed Messrs. Jackson & Shaw to commence the construction of a bridge at West Hoo Creek, without having first received the permission of the Corporation.

Board Schools and their Cost.—The whole amount of expenditure for school buildings, sanctioned up to April 30th, 1875, was 4,021,418*l.* The sums actually taken up as loans amounted on the 25th of March last to 3,151,000*l.*, or rather more than three-fourths of the sanctioned expenditure.

A New Tramway-Car.—The Scott-Moncrieff tramway car has been tried at Glasgow with success. The car, which is impelled by compressed air, is rather larger and heavier than an ordinary tramway-car, and can, it is stated, be driven at ten miles an hour, but its usual speed in towns is to be only six. At this rate the car can be taken up and down the steepest gradients overcome by the usual tramway-cars, makes no noise, and is said to cost for motive-power only 1½d. a mile, against 7d. per mile when drawn by horses. The invention, if really as cheap as is alleged, is likely to be useful for cross-country railways.

A New Circus for Paris.—The large building on the Boulevard du Temple, known as "Les Magazins Réunis," has just been leased for twenty years to Mr. W. J. Myers, an American circus proprietor. The interior courtyard is 240 mètres in length, and 135 mètres wide. The entire roof is covered with glass, supported by iron girders, after the style of the Floral Hall, Covent-garden. Messrs. Defries, of London, have contracted to light and decorate the building, which is being remodelled by a French firm. When complete, it will seat about 7,500 persons.

Cost of our Fortifications.—From a return just issued by the Government we learn that, up to the present time, we have spent close upon seven millions (6,987,910*l.*) upon our national fortifications. By far the largest sum expended at any one place was at Portsmouth, where close upon three millions have been spent. Plymouth stands next with 304,680*l.* and 1,181,816*l.*, making a total of 1,486,496*l.* Portland is third on the list, but with less than 400,000*l.* A sum of 377,686*l.* was spent in providing and fixing iron shields.

St. George's Church, Worthing.—This church, which was partially erected some few years back, has just had a large entrance corridor added towards the sea front, also a good semi-circular ended vestry, &c., towards the west, with a boundary wall to inclose the land and a few other improvements also. The transepts, with tower and spire, have still to be built to make the church complete. Mr. George Truefitt is the architect to the building, and Mr. Smith, of Worthing, was the builder for the late additions.

Supposed "Rattening" by Brickmakers. A serious case of "rattening" has occurred at the new Military Depôt, at Warwick. The contractors, Messrs. Davis & Banbury, had, at great expense, erected a machine capable of making 28,000 bricks a day, and some miscreant has placed a pick-staff between the rollers, and otherwise damaged it so that the machine cannot be worked. A serious loss will result to the contractors. A reward has been offered for the apprehension of the offenders.

New Market for Rotherham.—On the 23rd ult. Messrs. Hill & Swann submitted to the Market Committee of the Rotherham Town Council two block plans, marked A and B, of the proposed new market. The Committee recommend that the block plan marked B be approved, with the addition of arches extending 40 ft. from the lower end, and providing the work can be done for 5,000*l.*; and that the architects be instructed to prepare the necessary drawings, elevations, and estimates for the work.

The Bessemer Steamboat Company is stated to be in liquidation, and the *Bessemer* is for sale. The failure of the enterprise is said to be "in consequence of the want of the requisite accommodation in the French harbours." Was not the extent of this accommodation known before the Bessemer was built?

Tadcaster Church.—Notwithstanding the protests of antiquarians and others, the whole of this interesting edifice, with the exception of the tower, will, it is stated, be entirely taken down in the course of six weeks. The work is progressing rapidly, the interior being now gutted and the building unroofed.

TENDERS

For the Enfield Industrial School. Mr. T. J. Hill, architect. Quantities supplied by Messrs. Osborne & Russell:—

Field	£2,090	0	0
Bayes & Ramage	1,890	0	0
Bentley	1,850	0	0
Patman (accepted)	1,787	0	0
Fairhead	1,769	0	0
Sabey & Son	1,763	0	0

For constructing a portion of the main drainage works in the Coombe Pafford Valley, St. Marychurch, Devon. Messrs. Tarring, Son, & Wilkinson, surveyors :—

J. & G. Beal	£2,448 10 2
Wilcocks	1,897 0 0
Shaddock	1,379 0 0

For rebuilding first portion of Stoke House, near Bletchley Station, for Mr. B. T. Fountaine. Mr. J. T. Lawrence, architect. Quantities by Mr. H. Cooper :—

T. & S. Orchard	£4,500 0 0
Edwards	4,312 14 0
Twelvetrees	3,998 0 0
Staines & Son	3,974 0 0
Stephenson	3,948 0 0
Wigmore	3,799 10 0
Foster	3,750 0 0
Ireson	3,750 0 0
Adams	3,599 0 0
Dover & Co.	3,379 0 0

For a villa for Mr. Handley, Highbury. Mr. T. J. Hill, architect :—

Keen	£746 0 0
Webber	714 0 0
Davies	395 0 0

For building new premises, East India-road, for Mr. Gundlach. Messrs. Hammack & Lambert, architects :—

Judd & Hawkings	£509 0 0
Chaffen & Jarrow	497 0 0
Mitchell	477 0 0
Abrahams	465 0 0
Riddle	455 0 0

For building two houses, coach-house, and stable, in the Herbert-road, Woolwich, for the Imperial Property Investment Company, Limited. Mr. George Lethbridge, architect :—

Judd & Hawkings (accepted) ... £1,278 0 0

For erecting a play-shed and making certain alterations in the boys' school buildings, for the Newport (Isle of Wight) Board of Guardians :—

Ball	£431 9 9
Dyer	397 15 0
Cooper	395 5 0
Saunders (accepted)	391 9 0

For the enlargement of the Board-room of the Union Workhouse, for the Gloucester Board of Guardians :—

Peters	£614 0 0
Jones	589 0 0
Meredith	478 0 0
Cullis	440 0 0
Sims (accepted)	439 0 0

For the erection of buildings for the Long Eaton Working Men's Co-operative Stores. Messrs. Robert Clarke & Son, architects :—

Hodson & Facon	£5,197 0 0
Slight	4,890 0 0
Jelley	4,913 0 0
Messom	4,749 0 0
Vickers	4,690 0 0
Slin	4,390 0 0
Duke	3,370 0 0
Poxen (accepted)	4,300 0 0

In the matter of 44 and 45, King's-road, Brighton :—

		Deduct if bay windows above first floor are not executed.
Barnes	£6,550 0 0	£225 0 0
Newman & Mann	6,275 0 0	285 0 0
Merritt & Ashby	6,150 0 0	250 0 0
Cheesman & Co.	5,890 0 0	240 0 0
Chappell	5,872 0 0	189 0 0

*** This list has appeared before; but the gentleman who sent it had *added* to the general amount what should have been deducted.

For the erection of Board schools and residence, Potton, Bedfordshire. Mr. J. G. Raynes, architect. Quantities by Mr. Charles Kirkby :—

Woodman	£4,333 0 0
Osborne	4,146 0 0
Twelvetrees	4,125 0 0
Burnage (too late)	3,705 0 0
Redhouse	3,607 0 0
Langmead & Way (accepted)	3,535 0 0
Rainsford, Son, & Bartle*	3,196 5 0

* Withdrawn.

For Langdon Hills Rectory, Essex. Mr. Wm. White, F.S.A., architect. No quantities :—

Woodbridge	£1,775 0 0
Hammond	1,775 0 0
Gregory (accepted)	1,769 0 0

For new roofs and other works at Corringham Church, Essex. Mr. Wm. White, F.S.A., architect :—

Gregory (accepted).

For alterations at the Old Hall, Asfordby. Mr. R. W. Johnson, architect :—

Herberts	£1,098 0 0
Halliday & Cave	975 0 0
Neale & Son	964 10 0

For factory at Kettering, Northants. Mr. R. W. Johnson, architect :—

Margetts & Manley	£2,661 0 0
Bellamy	2,538 0 0
Henson	2,422 0 0
Sharman	2,389 0 0
Barlow	2,320 0 0

For new schools and residence, for Great Dalley School Board. Mr. R. W. Johnson, architect :—

Hayes	£1,210 0 0
Neale	1,075 0 0
Weaver	1,073 0 0
Barnes	950 0 0

For new schools for Garthorpe and Costa School Board. Mr. R. W. Johnson, architect :—

Weaver	£591 0 0
Barnes	524 10 0
Chester	483 0 0

For formation of new streets at Kettering. Mr. R. W. Johnson, surveyor :—

Henson	£2,160 0 0
Nowell & Robson	2,067 0 0
Paget	1,964 0 0
Lynch	1,934 0 0
Jones & Fitzmaurice	1,922 0 0
Pound	1,855 0 0
Sharman	1,770 0 0
Barlow	1,710 0 0
Mangells	1,685 0 0

For new Wesleyan chapel, school, and minister's house, Chichester. Mr. A. Lander, architect. Quantities supplied by Mr. R. Carpenter :—

Fielder	£4,207 0 0
Smith & Co.	4,001 0 0
Burton	3,985 0 0
Marshall	3,957 0 0
Smart	3,917 0 0
Quick	3,864 0 0
Coles	3,757 10 0
Sibley	3,648 0 0
White	3,317 0 0
Burbridge	3,224 0 0
Lose (accepted)	3,016 0 0

For new entrance-lodge, Booth's Hall, Knutsford, Cheshire. Mr. Arthur Vernon, architect :—

Molyneux & Son	£625 0 0
Leicester	560 0 0
Stelfix, Carter, & Rylance	534 0 0
Tickell & Son (accepted)	475 0 0

For new Board schools, with master's residence, at Tyler's Green, Bucks, for the High Wycombe School Board. Mr. Arthur Vernon, architect :—

Woodbridge (accepted) £1,870 0 0

For house and stabling at Stamford, for Mr. Orlando Edmonds. Mr. Wm. Eve, architect :—

Corby (accepted) £2,674 0 0

For fittings to new bank, at Peterborough, for Stamford, Spalding, & Boston Banking Company. Mr. Wm. Eve, architect :—

Hall (accepted) £538 11 0

For alterations and additions to 124, 126, and 128, Goswell-road, for Messrs. Carter, Paterson, & Co. Mr. Wm. Eve, architect :—

Salt	£1,375 0 0
Woodward	1,340 0 0
Crabb (accepted)	1,255 0 0

For alteration of shop at 75, High-street, St. John's Wood. Messrs. Ebbetts & Cobb, architects :—

Perkings	£199 0 0
Aitchinson & Walker	179 0 0
Steel, Brothers (accepted)	136 0 0

For re-building 205, High-street, Shoreditch. Mr. W. Bradbear, architect :—

Goodman	£697 0 0
Garrad	683 0 0
Riddle & Son	645 0 0
Steel, Brothers (accepted)	615 0 0

For alterations and repairs at 38, Great Queen-street, Lincoln's-inn-fields. Mr. W. Bradbear, architect :—

Riddle & Son	£372 0 0
Steel, Brothers (accepted)	270 0 0

For alterations and new shop-front, No. 385, Brixton-road, for Mr. C. Newsom :—

Haydon	£115 0 0
Howse	112 0 0
Pearce	89 15 0

For Primitive Methodist chapel, Romford. Mr. E. C. Allam, A.I.C.E., architect :—

Gordon	£1,518 0 0
Davey	1,242 10 6
White	1,159 10 0
Hinds	1,100 0 0
Barwell (accepted)	925 0 0

For a dwelling-house for Mr. B. McLeod, Chislehurst. Messrs. Stenning & Tyerman, architects :—

Crossley (accepted) £3,000 0 0

For the erection of saw-mills, chimney-shaft, and sheds, at Deptford, for the General Steam Navigation Company. Messrs. Stenning & Tyerman, architects :—

Murris	£910 0 0
Pattison	884 0 0

For alterations and additions to St. Katherine and Irongate Wharfs, East Smithfield, for the General Steam Navigation Company. Messrs. Stenning & Tyerman, architects. Quantities by Mr. H. F. Gretten :—

Ashby & Horner	9,690 0 0
Holland & Hannen	9,033 0 0
Webster	8,900 0 0
Macey	6,389 0 0
Sabey & Sons (accepted)	6,265 0 0

For the erection of a river wall, engine-houses, and chimney-shafts, for the Thames Steam Ferry Company, Wapping and Rotherhithe. Messrs. Stenning & Tyerman, architects :—

Gibson	£12,955 0 0
Perry	8,240 0 0
Lee & Son (accepted)	7,195 0 0

The tender of Messrs. Guynan & Son, for the whole of the blinds to the Rotherhithe Infirmary, Mr. Saxon Snell, architect, has been accepted.

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The Builder.

Vol. XXXIII. No. 1701. Saturday, September 11, 1875.

ILLUSTRATIONS.

The Old "Elephant" Tavern, Fenchurch-street 818
Sir G. G. Scott's Design for the German Parliament House: Plan of Principal Floor 820
The New London Central Poultry Market, Smithfield.—Mr. Horace Jones, Architect 821

CONTENTS.

Angoulême Excursion of the Architectural Association 809
The Æsthetics of House Building 812
The Loss of Stamina in our Industrial Population 812
Price of Land near Liverpool 813
Competitions 813
New Drainage and Water Schemes 813
The Land on the Great Orme's Head, North Wales: Alleged Illegal Inclosure 814
Fireproof Safes 814
A Run through Oxford 814
Pershore Abbey 815
Deerhurst Church 816
Capital and Labour 816
The Transfer of Land 817
Some Old Houses and their Stories 817
Design for the German Parliament House 820
The New London Central Poultry Market, Smithfield 823
London Architecture 823
Protection from Lightning 823
Improvements at Cambridge 823
Covered Yards for Farmsteads 824
The Coal Question 824
Irish Labourers' Homes 824
Miners' Safety Lamps 824
Cottage Hospital, High Wycombe, Bucks 824
The Nomenclature of Irish Towns 824
Compensation Cases 825
Arbitration Case: Pierpoint and Others v. Artingstall 825
General Foremen and Clerks of Works 825
Bricklayers as Clerks of Works and General Foremen 825
The new Street, Marylebone 825
School Board Schools 825
School-Building News 825
Church-Building News 826
Dissenting Church-Building News 826
Roman Catholic Church-Building News 827
Proposed new Cemetery at Wandsworth 827
Mr. Ruskin on Museums 827
The Railway Jubilee 827
Statues 827
The Right to Sewers 828
The Restoration of the Tuileries 828
The Decrease of Water in Rivers, Streams, and Springs 828
Inn Accommodation for Students 828
Handrailing 828
Books received: Hill's Homes of the London Poor (Macmillan & Co.) 828
Miscellanea 829

Angoulême Excursion of the Architectural Association.

LAST week we were enabled to give a general statement of the proposed objects of this excursion, and to mention the first day's work. The second day (Tuesday, August 31) was still more interesting than the first. The party proceeded as on the Monday, from Angoulême in two conveyances,—a cross between the omnibus and the old French diligence,—to La Palud (otherwise called La Couronne, from a monastery now in ruins, to which the hamlet of La Palud was a kind of dependency). The church is a small but very complete and unrestored specimen of a central dome, surmounted by a very elegant octagonal lantern and spire. These spires, which are very common, are invariably circular on plan, and each of the stones (which are small) is cut into a sort of scale, the point being uppermost.

The next point was Roulet, which is undergoing restoration. The original lantern and spire, whatever it was, is replaced by a new one; but there is still a great deal of the church remaining in an authentic condition. It is of great beauty, especially the nave, which is covered with three domes, one to each bay. These, on plan, are circular; but at the crossing is a dome elliptical on plan, the shortest axis being east and west. The transepts and choir are covered by wagon vaults. The church of St. Estephe did not delay the party many minutes; but the chief interest of the day was in the final point, Mouthiers.

Mouthiers is very fine, both inside and out, and acted as a complete restorative to the party after the hot and very jolting drive, over by-roads, from St. Estephe. The church is perfectly undisturbed, and generally in a sound state, although ill-drained and very dirty. The plan is very well ordered and simple. It has a nave, transepts, and apsidal-ended choir, generally apteral; but the transepts have each a small apse opening out of the eastern walls, all covered with slightly-pointed wagon-vaults. The nave has ribs; the choir and transepts are plain; the crossing is covered by a dome very slightly elliptical on plan,—so slight that it may be neglected in describing it. Pendentives are formed, in the first place springing from the arches of the crossing; that is, they form approximately portions of a spherical shell springing from the level of the abacus of the pier arches. When this has been carried up about two courses higher than the top of the arches of the crossing, the spherical surface is stopped by a horizontal band carried all round. A little within this band springs a regular hemispherical dome slightly stilted. Immediately above this band, and at the cardinal points, are four small square-headed openings pierced through the dome. They seem to have been designed for a temporary purpose, that of placing the timbers which supported the centres used in building the dome. The spherical surface below the dome, which is formed by the pendentives, has been called *approximately* true from this circumstance, namely, that the arches of the crossing which carry them are slightly pointed, instead of being semi-circular, which would give true pendentives. The way in which this difficulty is got over is very simple in construction, but it would be perhaps tedious in description, and can be better reserved for explanation by drawings. This account of the dome of Mouthiers may be taken as a representative description of all the central domes of the district. There are, however, varieties,—cases, for instance, of eight-sided (not octagonal) plans, with the domes themselves gradually working into the circle; but in one instance,—Passirac,—retaining the eight-sided figure all the way up, and *squinches* are used to get the octagonal form, instead of the pendentives. Mouthiers has a very fine east end, both externally and internally, and the capitals are amongst the best instances of intertwined imaginary animals and foliage. One feature must not be omitted. At the south-east pier of the crossing, a narrow and lofty arched passage is pierced both out of the transept and out of the choir, giving, as it were, the rudiment of an aisle, detaching the pier, and making an agreeable variety. There is, however, ample allowance still made for the solidity required for the superstructure. Its use, as giving the clergy and their attendants access to the choir, independent of the central approach, will be at once apparent.

Mouthiers was again visited by the party on Wednesday, leaving Angoulême by rail at six a.m., and was entirely measured for plan and section, and nearly all the quaint capitals were drawn. General perspective views, both of the interior and exterior, were also taken.

Plassac was next visited, and a great treat it was. The church is well situated on high ground, quite detached, and not pressed upon, as so many are, by domestic buildings. It is small, but of great merit, both in composition and detail, and perfectly untouched, except by some natural decay. It has an extremely good west front of three arcaded stories. It has the invariable arrangement of three arches below; and above them in this case [for the upper arcades vary in number in different examples] are two stories of four arcades each, above is a plain gable. The centre is crowned by an elegant octagonal lantern, with a spire of the same kind as already described. The characteristic and most admirable feature is the apse of the choir, both within and without. There is a barrel vault, as usual, slightly pointed. The wall exhibits eleven arcades; five of these have been pierced for windows originally. The internal cornice above this arcade is the most remarkable feature. A moulding of great projection is carried by bold corbels, between which are square panels, or metopes, carved with wreathed knots of foliage. The capitals of the columns in this district are (as already mentioned at Mouthiers) generally ornamented with gryphons, or other imaginary creatures, struggling and quarrelling, and intertwined in a most fantastic manner, and combined with foliage derived from the acanthus type. Those of Plassac were peculiarly graceful, and seemed to show that the artists who carved them had not failed to study classical forms. At this church the travellers were left quite to themselves, without any interference from the curiosity of the neighbourhood,—an agreeable variety in their general experience. The more educated people, however, have invariably shown themselves kind and attentive. This refers particularly to the clergy and the maires of the different small towns which have been visited. In several places, however, the gendarmes thought it necessary to question the right of the students thus to scour the country, and Mr. Sharpe has had several amusing discussions with them. Had it not been that he is armed with a letter from the Bishop of Angoulême, which he produces when ordinary arguments have failed, they would very probably have given considerable trouble.

From Plassac, Mainfonds, a Greek cross church, was visited; then Champagne, chiefly remarkable for its beautiful choir, of a strictly Romanesque type, of a very masculine and solemn style of architecture. Blanzac is a very remarkable specimen. Very little remains of the twelfth-century church except the central tower, but this was considered so beautiful, when the church was rebuilt in the fourteenth or fifteenth century on a much wider plan than before, that the tower was left standing in the centre with its external buttresses and internal arches standing completely within the walls of the wider church, which touches it only where the newer vault abuts against it. The old tower again re-appears above the roof, and still forms the best feature of the whole, although it was considerably heightened at the time of the newer construction.

Thursday's expedition was to Puyperoux, a church of an extremely solemn and grave character, massive and comparatively low, standing by itself on a fine situation. In this church all the four piers of the crossing have passages formed around them; but they are not of the architectural character that was exhibited in the instance described at Mouthiers. Passing by Mont-Moreau, where there is a restored church and a fine château, the day was ended by a well-combined attack upon the west front of Chalais, the only portion re-

maining of what must have been a magnificent church, and itself a fragment, for only the lower story, with the usual three arches, remains. But such arches! There is also a large château which was visited, but which scarcely repaid the time occupied. The excursion took up its head-quarters at a small railway hotel at Chalais for two nights, but was exceedingly well taken care of, and good lodgings were obtained for the members in various parts of the town.

Friday morning's start was to St. Quentin, which, owing to the badness of the roads, required a walk of about two miles from Chalais to the church, and nearly the same distance afterwards to join the conveyances,—a walk much pleasanter at seven o'clock, when it began, than at eleven, when it ended. The church, however, fully repaid the journey. The plan here was interesting: most of the original work was left, but aisles had been built in the fourteenth or fifteenth century on each side of the original apteral nave, and the piers in their plan showed in the north and south dimensions the entire thickness of the original massive wall, but were very narrow by comparison when measured in a direction east and west. The choir was of the original construction, and a very fine specimen. The next place visited was Aubeterre, and in the journey some exceedingly beautiful country was passed over. The whole surface is clothed with vines and walnut-trees,—the latter chiefly grown for the production of oil. At Aubeterre, a town having a magnificent situation, are the ruins of a noble mediæval castle, and beneath it a very remarkable rock-cut church dedicated to St. Jean. It consists of several chambers. The largest has an apse and an aisle towards the deepest part of the rock, which is supported or strengthened by two huge octagonal pillars, which have been left in excavating the aisle. The general work is of the time of the Renaissance, but part is said to be earlier. Aubeterre has also the remains of a west front (the rest of the church having perished), which seems to have been almost a repetition of the west front of Chalais, except that there are always variations of detail in the repetitions of the twelfth century; and as it still retains its arcade of thirteen arches above the three great arches of the lower story, and in the story above this there are still the remains of the horse which marks the tomb of the founder, it serves to explain, to a certain extent, how that at Chalais, which, as far as it goes, is the finer specimen of the two, was finished. The inhabitants here, without being at all troublesome, seemed to take much interest in the proceedings; and, indeed, it was not without interest to any spectator to see the quickness and activity of the different students to whom the various duties of climbing about the old front or measuring and plotting down the different parts had been assigned. At this place, and also at Chalais, the attack was made more complete by the addition of a photographer, M. Fellot, who has been acting under Mr. Sharpe's direction. From Aubeterre, the party returned to Chalais.

Saturday's excursion lay amongst places rather picturesque than highly eminent for architectural character. The examination of Passirac was delegated to one party, amongst whom was M. Varin, architect, of Angoulême, who accompanied Mr. Sharpe on this day's excursion. The rest proceeded to Chillac. Here, a west front of some interest was measured, and a very picturesque château, and which contained a very remarkable and splendid chimney-piece, was sketched by several hands. Berneuil, with a good west front and east end, and a fine situation; and Coudeon, with a good but decayed west door; and Barbezieux, with a good inn, where the party dined after a hard day's work; and a return by train to Angoulême in the cool of the evening, brought the first week's work to a finish.

The weather has been most propitious, and there has not been a single *contretemps* worth mentioning. Judging from casual opportunities of examining the various sketch-books and portfolios, a great deal of valuable work has been secured, and M. Fellot thinks that his negatives have been well taken.

The Church Congress.—Among the subjects to be discussed at the forthcoming Church Congress, which will open at Stoke-upon-Trent on the 5th prox., will be that of "Ecclesiastical Dilapidations."

THE ÆSTHETICS OF HOUSE BUILDING.

A HOUSE presents itself under a very different aspect to different people who are concerned in it. To the proprietor for whom it is built, its interests are more varied than to any one else, probably—the idea of it as an investment, an addition to the family property, perhaps usually predominating; and the experience of its comfort and convenience being the next consideration. To a lady, a house is a place in which cupboards can be contrived. To the contractor it is a specimen of work done and material employed, in accordance with various instructions in the drawings and specification, and representing a percentage in his pocket. The architect has his share in the percentage source of interest too; we will hope he seldom confines his view of the matter within these limits. But in many, perhaps the majority, of cases, the contrivance of a new house is an altogether matter-of-fact and business-like affair. The author of a large and useful work on house-planning has, in fact, expressed it as the result of his experience, that the average English gentleman dislikes the importation of anything into the design or arrangement of his hous which can be called artistic or picturesque ut which can in any way point it out as the r his of an individual taste, distinct from tha that neighbours. There is a half suspicic And vulgarity is implied in such a distinction most not infrequently the architect is occupied on of exclusively in the practical consider to pro- planning and specification, and the eff roughly vide for everything being honestly and bout the done, and does not take much trou the senti- question of appearance the building will be ment that will perva npretending," and has erected. The house is it gets cast into the no architectural style; ture which he is in the mould of domestic archit e repetition of others habit of using, and is a c , and of those which built before on different s e it comes that so shall be built after it. H regard to their out- many mansions look as if, in a pattern-book, side, they had been copied f udor, or Italian, or were slices from a block the case may be, or Queen Anne architecture country. cut off and scattered about of those for whom

If it be true that a major rently wholesale houses are built prefer this he architect who manufacture, at least it is at superior good should encourage the idea ested by such a taste and refinement are m which is to be preference. In building a country, and a a permanent landmark on t g-place for the permanent residence and gather there may family and descendants of its owner, mere be something more thought of than the specification excellences of sound wood and good brickwork, or the mere convenience of satisfactory plan and patent kitchen ranges. It would seem superfluous to say this, indeed, did we not find many architects practically, and some avowedly, ignoring it; and the majority of architects' clients placing the height of their wishes in having a "comfortable" house. Nor do we, of course, undervalue this practical side of the question. It is, in fact, the basis of domestic architecture; comfort and health are the things first to be considered, and appearance afterwards; and whenever this order of things is inverted, there is an element of sham introduced. But so much has been said and written on this side of the question, that there may be some excuse for looking at the other side a little, and considering a house for the moment exclusively from the æsthetic point of view.

Even those who profess to be entirely practical in their view of the matter, are more influenced by the æsthetic consideration than they are themselves aware of. Otherwise, how is it that the same man who, if he builds for himself, will order the comfortable house, and nothing else, will express himself so much pleased with some rambling country residence, not particularly comfortable, possibly not particularly sanitary, but presenting a picturesque interest and variety in its lines of thoroughfare and capricious alterations of level? The interest here is partly that of association, of a dwelling with a history and reminiscences, no doubt. But it is not wholly that; it is partly also that there is distinct character, even suggestiveness, in the old country-house. But in these practical days there is a notion that anything of that kind—anything characteristic, out of the usual routine—is unpractical, and that some practical advantage is necessarily sacrificed for it. And, in obedience to this notion, this popular superstition, we build dull or uninteresting houses; and while people are all agreed as to what to admire in old houses, and are willing to make small pilgrimages to visit them and sketch them, they go back and build their own dwellings in a manner directly and purposely shorn of all such attractions, and as if one object were to distinguish a modern dwelling from an old one by studiously banishing from the former all that we admire in the latter.

A good deal of this comparative dulness and want of interest in a modern house arises from its being originated too exclusively under office and drawing-board influence. It is made on paper, and then set up in the midst of the landscape in which it is to form a feature, with no reference thereto either in composition or material. For the first part of the æsthetics of house-building is in regard to that which concerns the outside spectator, perhaps more than the inhabitant and owner,—the figure which it makes in the scene. The distinction between old houses and new in this respect,—the superior picturesqueness of the former,—is not merely the result of the long process of weather-staining which brings them into harmony with the prevailing tone of the landscape. It is partly, perhaps, that they have arisen in a more unsophisticated fashion, been built and added to piecemeal and on no formal design; partly the accidental circumstance, as in one sense it may be termed, that local material has been more used in their construction than is often the case in modern buildings in the country. The increased facility of traffic in modern days not only tends to obliterate local distinctions of manners and character, but similar distinctions of building and workmanship also. Before the railway period different districts had their own materials at hand and their own method of building, which (except in the case of unusually large palatial mansions for which workmen were summoned from afar) thus became a portion of the local character of the district. Now, the same materials go over a great part, sometimes over the whole of the land, and the same contractor may have work to carry on at places far asunder geographically, and transport the same workmen from one to the other. This is, of course, the natural result of an altered state of things, except so far as the use of material is concerned. There is really no reason for the transportation of a particular material which has become fashionable into every district it can be got to; for taking patent compressed brick into the midst of a district possessing building stone of its own. There are, in fact, very few neighbourhoods which do not furnish materials with which walls may be constru durably and efficiently, if the right pr ocess of manipulating them be employed.

The value of this consideration as to local material will, of course, be differently judged in proportion to the more or less artificial view taken of domestic architecture. If a dwelling is regarded as, under any circumstances, a purely artificial object, to be designed after some set pattern, or in a fixed style with precedents and conventional details to be observed, perhaps, in that case, the more artificial the material in contrast to the surrounding scene the better. The dwelling then appears as something to be judged of apart and as a whole, quite independent of its surroundings. And this is, no doubt, the right aspect for a town-house. Everything in a town is artificial, and there is neither reason nor good taste in trying to give it any other aspect. But in the country it is only in the case of a mansion of the largest scale and the highest pretensions that the purely artificial architectural treatment can be suitable. It can be so here, because a great mansion almost claims to be considered, in the midst of the country, as a small town in itself; and its surroundings are sufficiently extensive to give opportunity for a gradual connexion of the house with the landscape by the intervention of terraces, formal plantations, and accessory buildings. And the natural character for a mansion of the largest class, which is always more or less a state or show residence, is that of stateliness and palatial dignity, which is better achieved by a formal and symmetrical architectural style than by a quasi-picturesque dress. The latter aim is always connected, too, with the expression of domestic comfort, which is not the paramount expression of the mansion *par excellence*. Some fine instances of the picturesque or "romantic" treatment of a great house will occur to most readers, buildings which show much for interest and admiration; but the tendency of this style of treatment, which pre-

sents the mansion rather as an agglomeration of parts, a group of structures, than as one structure, is to lose the idea of size, from any one point of view, and to convey the impression too much of a greatly magnified villa. We are not arguing for the employment of "classical" symmetry in a great house, for the old "Blenheim" regularity or duplication of parts, where the kitchen balances the chapel. That must be nearly always false, to begin with, as the opposite extremities of a house are never of equal importance, or for similar uses; and it is dull and formal besides. What we would see in the mansion is not absolute formality, but a certain regularity and stateliness, as of an establishment which is self-dependent, and has its own life apart from that of the "country side," which is really the state of the case. The mean between too little and too much formality of design is often happily attained by the grouping of a symmetrically designed centre (the state portion of the house) with unsymmetrically grouped dependencies, by means of which a disagreeable formality can be avoided. But a certain amount of symmetry and grandeur of design, of horizontal line and contrived repetition, goes better with the extended approaches and terraces which such a mansion should never be without, than does an endless variation and tossing about of outline and plan, by which the effect of mass and repose is weakened and broken up.

Such an effect, however, should be aimed at in some other way than by the application of the pure Italian palatial style, which is the chief precedent we have to go upon so far. Fine as are some of the English examples in this style, in the abstract, the style has in many respects been found wanting, for this country; and regarded in relation to the peculiarities of English landscape and atmosphere, it is too colourless and too deficient in incisiveness of detail, not to look cold and flat in all but a few days in the year in this latitude. But there is room really for the suggestion of something new in mansions of this class, in the combination of the horizontal lines and repeated features of Italian architecture, with a use and treatment of material affording more surface texture, and more of colour effect. The weakness of the pure Italian style under any but a bright sky, is in its artificial and "smoothed-out" appearance, which looks poor and bare in dull weather, and absolutely miserable in wet weather. To attain a more powerful and less washed-out effect, it is necessary to get rid of what may be called "the ashlar superstition," in dealing with forms based on Italian architecture; to use materials that will show more joint and more decided surface variation, or to work the materials so as to obtain this result. What is called the Queen Anne style, as practised at present, shows something of a compromise between Italian regularity and a too free picturesqueness; but we cannot regard this as sufficiently dignified, sufficient of a style, in fact, to be worthy the situation in the case of houses of the highest class. Moreover, the patent brick treatment, which is almost universal with the Queen Anne practitioners, is again too weak in surface and hard in line to give the counteracting effect we suggest; and one can hardly regard a homogeneous bright red (the prevalent tint) as a satisfactory *ensemble* for a large building. There seems to be room for new combinations of material in what may still be called (for want of a better name) an Italian style; combinations, for instance, of stone and brick, not in the hackneyed form of brick with stone dressings, but of stone substructure and brick superstructure; or different qualities and tints of stone employed in a similar manner, and so worked and disposed as to afford both surface for light and shadow, and something of chromatic contrast or relief. In short, the experiment of bringing to bear upon a symmetrical or quasi-classic style the same variety and piquancy in the choice and workmanship of material which is, in a great many cases, considered a *sine quâ non* in anything that comes under the title of "Gothic" house architecture, has yet to be fully tried, and may be equally well applied to designs based upon symmetrical, or, if we like to call them so, Italian models. On some such principle of treatment there is room, too, for getting rid of the very artificial appearance which the pediment and window-dressing style has when viewed in connexion with English landscape, with the spirit and character of which it has really no affinity whatever.

It is rather surprising that towers, in the true sense of the word, are not a little more used as an addition to the architectural effect of houses of the first class, in designing which economy is a secondary consideration. An elevation of one corner, or perhaps two opposite corners, of the building, to a height perhaps a little above the ridge of the roof, is common enough; but a thoroughgoing *tower* to a large mansion is a rarity. Yet there is no finer way of gaining architectural effect, of making the building a feature in the country, and of varying and contrasting the composition of a building more or less symmetrical in its main disposition. The few instances in which this has been tried in modern mansions have drawn so much attention and commendation that it is surprising this source of effect is not more applied to the highest branch of domestic architecture in England. The contribution to the features of the country would be far more important and picturesque than is ever attained by the usual square-proportioned comparatively low mansion, which seldom asserts its presence at all except in its immediate vicinity.

It is in the far more numerous class of houses of medium size that the relation of the architecture to the nature of the site becomes closer and more intimate. And here, in regard to the country-house, the formal and artificial development of architecture of the pilaster and pediment type seems irreconcileable in any way with the situation, and, in fact, is seldom proposed now by the architect; though it can hardly be said that it has given place, in general, to anything really satisfactory and interesting. We have made a great improvement, no doubt, of late, upon the old notion of a country-house,—a cube of brickwork, with symmetrically-disposed openings for windows,—a slice of the town street put down into the country; but one may certainly tire of the eternal gabled house which has taken its place. Looking through any book on country-house and "villa" architecture, it would seem that the receipt for it now consists mainly in dividing out the plan into two or three cubes, by small breaks in the line of the outer walls, and gabling these different ways. It is a good way of getting varied skyline over a rectangular plan; but there are surely other ways of getting effect in rural dwellings. These are to be looked for mainly in the character and disposition of the materials employed, and the grouping of window openings and other features; but more especially in the former source of effect, which has been quite under-rated and neglected by English architects in their adherence to certain habits of employing material, especially in the "brick and stone-dressings" fashion, which have become a kind of "vulgar tongue" of domestic architecture. The kind of picturesqueness of effect which we are thinking of has been successfully illustrated by one or two English architects; but more decisively so, perhaps, in such work as that of Herr Guldenpfennig, of whose admirable designs we have several times given illustrations, which show a feeling for the picturesque of material quite beyond what is generally seen and practised in this country.

Irregularity of plan and outline is generally in place in rural building, and is one of the marked distinctions between this and town architecture. As we approach toward the town, in fact, where site necessarily becomes more and more restricted in its extent and formal in its boundary lines, we progress naturally towards greater formality and symmetry in our building. The country-house, alone among its fields and trees, may indulge a licence and irregularity which seems natural and in accordance with its surroundings, but would appear an impertinent ostentation of picturesqueness in the midst of the more formal line of houses and gardens, with nearly equal frontages, which form the suburbs of nearly every town. Here we look for a certain recognition of the conditions of the site,—a certain concession to general effect, a uniformity in variety. It is not uncommon to see, however, in the midst of a line of unpretending and what would be called "respectable-looking" semi-detached houses, an insertion, by some proprietor or architect bent on asserting his individuality, of a building in utter contrast to all around it, and looking with its peaked gables and odd chimney-tops and profusion of gilt and spikey Gothic metal work, as if it were the result of a determination to arrest every one's attention, and to give a practical condemnation to everything else in the neighbourhood. The excuse for this is, of course, the excessively dull and uninteresting nature of average suburban architecture, to which no man of taste can submit to be tied; but there is an element of vulgarity in this, out of keeping with the best social and architectural taste. The process should rather be to take the prevalent form and proportion of the house architecture of the road, or "park" (for everything is a park now), as a basis, and then to consult the demands of a purer and more refined taste in a better working out in detail and in ornamental accessory. There is always plenty of room for refining and illustrating house architecture by such means, without deliberately adopting a manner by which a dwelling seems to condemn and fly in the face of all its neighbours.

As we come completely into town, and reach the point where street architecture in its restricted form begins, and where a house is, architecturally, only a "front and a back," formality and concession to the nature of the adjoining dwellings become more and more a matter of necessity, as well as of good taste. And here we may fitly employ what may be termed "school architecture," the artificial form of architectural design derived from the Renaissance. In towns, as we have observed, everything is artificial; or, if the aspect of some old towns contradicts the assertion, it is at least true of the modern formally-planned city, under sanitary regulations and building acts. Efforts to introduce the extremes of "picturesque" architecture into our streets must be made with the greatest care. Buildings are produced sometimes that are quaint and interesting in their way, but they look out of place among their surroundings, and one cannot but reflect that if the same taste were universally carried out, a most serious interference with the economics of town architecture, as well as its convenience, and even, perhaps, its sanitary character, would be a probable result. Where a number of buildings have to be formally packed into a line, and as many as possible got into a certain area, simplicity and a certain uniformity in character and external plan are almost indispensable. But we have always decorative treatment at hand to give individuality and artistic expression to each slice of habitation, without violently interfering with the prevalent lines of the others. Such expedients as the introduction of coloured marbles, of mosaics, of tile-painting (though the manner in which the latter source of ornament has been used has not been generally of the happiest), are in complete keeping with the conditions of town life and town domestic architecture. The artistic treatment of a street front, as such, has hardly received the attention it deserves from architects, and we need not say, looking round us, has not been made what it might be.

There is one other section of domestic architecture which almost demands consideration on separate grounds, and certainly seldom receives it; we mean what may be termed marine architecture,—building on the sea-coast. This is quite a different thing from country-house building, but is generally treated on the same footing. The qualities which please us as suitable to the feeling of an inland landscape are quite out of keeping with the character and associations of the sea-coast. The former should be quietly picturesque, the latter requires apparent strength, mass, and solidity. Marine architecture generally is the very reverse of this. One of the prettiest and most elegant of "villas" we remember to have seen was on a bleak sea-coast, and curiously out of place and starved it looked. Something of the "castle" character may reasonably be given to a sea-coast house, which should appear as if prepared to stand steady and uninjured against any gale it may have to face; it is perhaps the one situation in which castellated architecture—meaning thereby the employment of broad surfaces of walling, low and massive proportions, small windows, a general appearance of strength and immobility as the primary object—may be employed in modern house-building suitably and logically. In the realisation of such an effect, without absolutely imitating the mediæval castle form, there is room for something really almost new in house architecture, if any one would try it.

In a future number we may go further into the consideration of our subject in relation to plan and internal arrangement, considered with regard to effect.

Messrs. Cassell's New Buildings. — The contractors for this work, recently illustrated in our pages, were Messrs. Browne & Robinson. Mr. B. Finch acted as consulting engineer. The steam-lift was supplied by Mr. J. Stannah, of Southwark-bridge-road.

THE LOSS OF STAMINA IN OUR INDUSTRIAL POPULATION.

It has for some time been suspected by scientific men that the human race, or at least certain portions of mankind, were subject to a law similar to that which appears to have regulated the long succession of species of which we obtain information from the geological record. In other words, it is suggested that man, or at least certain tribes or families of man, are fading from the earth; whether to be replaced by a more noble and vigorous race or no is, of course, matter of pure speculation.

But the facts on which such a theory must be based are not merely speculative; on the contrary, they are of a practical nature, and come home to us all. Thus while, as a philosophic hypothesis, the general question is one of the first importance to the statesman, the historian, and the economist, those portions of the preliminary inquiry which relate to our own urban population have a special value for the sanitary reformer. They come home to every urban resident, to every parent of young children, and to every one who takes interest in the education and the welfare of youth.

What we may call the more general suspicion is based on very different observations. In one instance we find a man who has spent eight or ten years abroad, struck with the visible diminution, during that term, of the stature and apparent vigour of the London mob, as collected on any such annual occasion as that of the Lord Mayor's show. In another, an old employer of labour is struck by the craving for shorter hours, and by the manifest deficiency in the quantity, and even in the quality, of the work performed, in a given time by a given number of men. In another instance, a man, in the hale and hearty autumn of life, looks with a mixture of pity and scorn on the shrinking of younger men from physical exertion, or at the upgrowth of the numerous stunted figures in round hats and petticoat-like garments which, in so many a town and village, take the place of the stalwart and dignified form of the old English parson. In another instance, a drive, or a walk, through the outskirts of some great manufacturing town, or the accidental encounter of the population of a factory pouring forth at a break in their toil, tells the same tale. To broaden the basis of observation we may look abroad. In the western continent we see one well-known example of race becoming extinct. The Red Indian is rapidly removing his wigwams to the world of spirits. There can be little reasonable doubt that the race will soon be extinct. The Samaritans, who once held their own against the Jews, are now reduced, as a nation, to the number of 135 souls; 80 men and 55 women. Of the massive and full-limbed Assyrian race we have no living examples left. The same may be said of the Egyptian race, as it is depicted on monuments. It may be hardly apposite to point to the effects of such a thoroughly artificial source of national destruction as the slave trade, but it is indubitable that the teeming negro population of Africa is rapidly diminishing under the influence of this terrible scourge. Nor does transplantation always agree with the human stock. In New Zealand, under a climate like our own, the English race seems to acquire a new vigour. But in many parts of New Holland the extreme delicacy of the girls, beautiful as it is to the eye, gives small promise of vigorous descendants. In India, and generally in the latitudes where the black races thrive, it is simply out of the question for English people to attempt to rear their children. And throughout the United States the drawn and melancholy traits of the Indian physiognomy have become visible on the countenances of the descendants of Anglo-Saxon progenitors, without any intermixture of blood.

Exact knowledge, in this matter, it is difficult to attain. Statistics, indeed, would answer the question; but statistics are very difficult to obtain. In these parts of the world, where education has so far advanced as to render a census possible, the range of time over which such census extends is as yet too limited to give us what we seek. And anything like a census is in most places unattempted; while everywhere are to be found ignorant and prejudiced people who fight tooth and nail against any attempt to better the condition of mankind by the procedures indicated by science.

Thus our sources of positive, or rather of precise, information are limited pretty closely to our statistical publications, and to the inferences to be drawn from such calculations as those made for the guidance of the Life Assurance Offices. These, indeed, are minute; and have often been prepared by men of the highest capacity for mathematical investigation. But the access afforded to the public writer is to the result alone. No assurance company gives to the world the actual calculations which it has been at such cost to acquire. Again, the class of life assured is a picked class. It by no means follows that the average which may be safe for an assurance company represents national averages. Nor are we yet in a position to see clearly how much of the result of recent statistical inquiry is due to any change in general viability, whether an improvement or the reverse, and how much is due merely to greater care and accuracy in making and recording observations.

Another source to which attention may be turned in order to obtain information as to the viability of races is the number of births, not only as rated per head of the population, or per marriage, but as proportioned between the sexes. The genealogist is aware of the fact that, as a general rule, in those families which may be traced back from father to son for six or eight hundred years the decay of the stock has been manifested by the absence of sons. Daughters are born, in many cases that we could point out, in whose descendants the blood of the line may run when the name is lost. Even here we must not be too positive, as at times the sword has been the effective cause of the extinction of the male lineage. Thus before the battle of Agincourt the family and the territorial names of nearly all the French nobility were the same. Since that date the family name, very frequently, differs from that of the estate. The cause of this, no doubt, was the great slaughter of nobles at Agincourt. But while we thus admit causes of artificial disturbance, we can refer to numerous instances where long lines have fallen to the spindle, rather than become extinct. The subject is worthy of attention as matter of investigation by census returns; although our experience of the latter is too limited to enable us as yet to speak positively on the subject.

Again, it must be borne in mind that neither the prolific fruitfulness of a people nor the average length of life attained by its members, can be taken as a measure of the vigour of the race, apart from other considerations. With regard to the former test, indeed, it may almost be said that the number of births is in an inverse ratio to the physical welfare of the race. We do not assert that such is the case, but the position is by no means untenable. There is no doubt that, whatever be the cause, the proportion of births to population differs extraordinarily in different countries of Europe, to say nothing of the rest of the world. Thus, while the annual increase of population in Saxony a few years ago was 15,500 per million, that in France was, at the same time, only 4,200 per million. The latter, indeed, is said now to have become a negative quantity. Thus, it is difficult to obtain much light on the subject of our research from existing statistic returns.

We are indebted to Dr. Fergusson, the certifying surgeon under the Factory Acts, at Bolton, for some evidence bearing on this subject, which is of great value. Whoever is an agent in the removal of any important physical or physiological question from the shadowy province of opinion to the measured region of science, is, to the extent of his work, a benefactor to mankind. Dr. Fergusson has brought before the Royal Commissioners appointed to inquire into the working of the Factory and Workshops Acts, in their sitting on the 3rd of July last, statements of which it is not easy to overrate the importance. While they can only be regarded as limited, both in the field of collection and in the degree of information which they supply, they may almost be described as laying the foundation for a new branch of biological science. When other people have given opinions or comparisons, of more or less authority, Dr. Fergusson has brought his patients to the scale beam. He has given us the definite result, in weight, of different treatments of the growing youth. Thus he has found that while a child between thirteen and fifteen years of age, fed on a milk diet, increased in weight some 15 lb. in a year, its growth when fed on tea or coffee, instead of milk, did not exceed 4 lb. in a year. It is evident that a series of observations as to weight and stature of growing children would give us a new element of sanitary science, of which it is not easy to foretell the importance.

Dr. Fergusson, during his official experience of fourteen years, has taken a deep interest in everything relating to the educational and physical well-being of the population. The results of his observations is the conviction that a steady degeneration is in progress among the factory population. He has been for many years inclined to this belief, very probably from reasons such as those which we have previously indicated, and he has taken the opportunity afforded him by his official duties to bring his opinion to the test of direct observation. He was struck, during the first few years after his appointment, with the large number of children who were proved to be thirteen years of age, but who were physically unfit for factory labour. The inspector of the district, on his application, informed him that he had power to reject all such cases. He was thus led to keep an accurate register of the physical condition of all children who came under his notice, and found that the number of children presented who were physically unfit for work went on increasing from year to year. He has, however, been given to understand that, in the existing state of the law, the certifying physician is not authorised to inquire into the physical condition of any children but those whose age is matter of doubt. Since last year, therefore, having been instructed to pass children who were physically feeble, on the production of a baptismal certificate or other direct proof of their legal age, he has noted not only the general physical development of each such child, but its actual weight. At the end of three, or of six, months, he has taken occasion to weigh those children again. In many instances he has found that there has been no increase in their weight; not so much as by a single ounce. In some cases there has been actual loss of weight. It is thus clear that when the physical powers of a child are overtaxed, its growth is stunted, and its health is impaired. That the length of its life will be shortened is also to be expected. But whether this be the case or not, it is clear that a national evil of much more importance than the shortening of the term of life attends on this overtaxing of the youth of the people. The progeny of the feeble and stunted parent will reproduce, and probably reproduce with exaggerated misery, the defects of their parents. Now, as nearly one-fourth of our population, or to speak with exactitude, 227 per *mille*, are engaged in what is described in the last census as industry, that is to say, in mechanical pursuits, exclusive of agricultural or commercial occupations, while not more than one-fourteenth, or 73 per *mille*, represent the country agricultural *proletaires*, it is certain that the menace thus held out as to the degenerated condition of the masses of Englishmen in the next and the succeeding generations is of the most grave and positive nature.

During the five years, 1869–1873, fully one-half of the children brought before Dr. Fergusson to certify that they were thirteen years old were physically unfit to work full time. Can the importance of such a fact be overlooked? Year by year the proportion increases. It is the opinion of Dr. Fergusson that the factory labour in itself is not the main cause of this steady decline. Whether as overtaxing the actual strength of the children, or as accompanied by the influence of bad atmosphere or food, absence of recreation, and want of sufficient rest, it seems, however, clear that the occupation is hurtful. Of course, it would be matter of great difficulty to apportion to each of these concurrent causes its due share of influence. But the fact revealed is of the most urgent importance.

Dr. Fergusson finds that the mills are now more carefully ventilated than was formerly the case. The actual work is not laborious; but the penning up of a growing child from the free exercise of limb and lungs, for at least a fair portion of the day, is something far more serious than the exertion of physical force expected of his hands. The first cause to which Dr. Fergusson traces the rapid decadence of the youthful population is the intemperate habits of their parents. By free indulgence in stimulants (no doubt chiefly gin), and by the use of tobacco, not only constantly, but from childhood, debilitated constitutions are produced, and are transmitted. Again, the use of milk as a food has been gradually superseded during the last thirty years by that of tea and coffee. Here, as we before mentioned, is a change of diet, the result of which may be absolutely tested by the scale beam. Third, is the increasing use of tobacco, smoked, chewed, or both, by boys of from twelve to twenty years of age. This practice acts as a direct check to the appetite, to the power of assimilation, and to the growth.

The immediate lesson of these disclosures is the urgent need of such an examination of the children who are destined to factory employment as may prevent the injury done to the entire population by such occupation of weakly children as may stunt their growth, and complete the destruction of their constitutions. On this it is not easy to insist too much. We are convinced that many of our readers will only require such a hint as we have given, in order to direct their serious attention to the subject, which for the present we commend to their consideration.

But we are very desirous that the observations to which we are referring should be not only continued but applied systematically over so large an area as shall give us a new source of statistical knowledge. Although the subject is one which has received a considerable degree of attention, it must be admitted that there is a great want of precise information with regard to the normal heights and weights of children at different ages. The differences, no doubt, are extreme, but the rule of healthy development, for an average child, ought to be ascertained. Very little reflection will show the importance of such knowledge. It is probable that when the necessity of its systematic treatment is brought forward, many physicians through the country may be able to contribute valuable detail.

The fullest treatment of the subject of the growth of children with which we are acquainted is to be found in a small quarto pamphlet, by Dr. F. P. Liharzik, which was printed at Vienna in 1862. If to this we add a series of papers, by Mr. Conder, C.E., in *Art* for 1872, and an article on the Canon of Beauty in the *Edinburgh Review* for July, 1874, we shall have cited the best authorities with which we are acquainted as to human proportion. The question of weight, which is not raised in these works, is treated in the "Inventory of the Food Collection," published by the Science and Art Department. From observations made on 2,650 healthy men, Dr. Hutchinson has arrived at the conclusion that a man 61 in. high ought to weigh 120 lb. avoirdupois; and that 5 lb. should be added to this weight for every inch in height. One seventeenth part, however, is to be deducted for clothes. Dr. Liharzik states that he has measured all parts of the body of 300 individuals, in every period of life; and made more than 6,000 special measurements with regard to the retarded development of the thorax, which he considers to be the first "cause of rachitic, scrofulous, and tuberculous affections." The average height of the full-grown man, according to Dr. Liharzik's average, is 1·75 mètres, or 68·91 in. This would give a weight, according to Dr. Hutchinson, of 160 lb. avoirdupois.

We will assume, for the sake of inquiry, the normal height of a model man at 72 in., giving a weight of 175 lb. avoirdupois. If we consider this stature to have been attained in the course of twenty-one years from birth, and that the weight of the infant at birth was 10 lb., we find an average increase of weight of 8 lb. per year. But growth continues, according to Dr. Liharzik, for twenty-four years, or indeed for 300 months. On the other hand, the full height is frequently attained by the eighteenth year. The development, therefore, from the eighteenth to the twenty-fourth year may be safely taken (for a first approximation) at the half of the earlier rate.

The relation between the height and the weight, if the development were perfectly regular, would be approximately that between a series of numbers and the series of their cubes. Late in the growth, as we have shown, the curve thus indicated would be inflected so as to give more value to weight, or girth, than to height. From the character of the proportions of childhood, it is probable that the same would be the case in the first seven years, leaving the most rapid growth in height, as compared with weight, between the seventh and the seventeenth year. As to this, however, observations are most desirable.

That an annual increase in weight of 8 lb., being equal to a daily increase of 153 grains, is not very far from the normal growth proper to a healthy child, we infer from the fact that two entirely different lines of investigation lead to closely corresponding results. At seven years old, according to this rate of growth, a child should weigh 66 lb. At seven years old, according to Dr. Liharzik, a child should measure 130 centimètres, or 51·19 in. If the cubes of the height be compared with the weights, it will be found that they tally within 3 per cent. At fourteen years of age the height attained, according to Dr. Liharzik, will be 93 per cent. of the full height; while on the theory of equal increments of weight it will be ·86 per cent. of that height. Such a coincidence seems to show that neither of the methods adopted, viz., mean of actual measurements, or allowing equal annual increments of weight, can be very far from the truth.

Now, we find Dr. Fergusson, while he notes as low a rate of increase as 4 lb. a year, between the ages of thirteen and fifteen, in the absence of proper diet, finds as much as 15 lb. gained in the year on milk diet. The higher gain is as abnormal as the lower gain. It can only be accounted for, either by the fact that the child was considerably below the normal stature at the beginning of the observations; or that it would greatly fall off in rate of growth after the period noted; or that the growth, as being too rapid, would cease too soon; or, finally and with the least degree of probability, that a colossal bulk would be ultimately attained. We should expect that the first and third of these suppositions would be found to concur; and that undersized children, when better fed, would grow too fast, and cease growing too soon.

We think it is the case that, even in the most healthy children, a perfectly regular growth is exceptional. So far as personal observation extends there are periods of more and less rapid growth, as far, at least, as height is concerned. But the more complicated the subject is, the more important it is to collect good observations, and to lay down, for the guidance of those who have charge of the young, the normal curve of the development of the English child, of each sex, both in height and in weight.

It may be very readily ascertained, by those public benefactors who will follow the course above indicated, how far the height and weight attributed by Dr. Liharzik and by our own rough rule to the child of seven, or of fourteen years old, corresponds to the actual average. We should fear that, among those children of whom we are speaking, very few stand 4 ft. 3 in. high, and weigh 66 lb., at the age of seven. We should fear that very few will be found to stand 5 ft. 4 in. high, and to weigh 120 lb. at the age of fourteen. Of the immense national value of comparisons like these there can be no doubt; what weight and statue avail, when they are not in disproportionate excess, was pretty clearly shown in the last Continental war. That the Germans are a taller race than a portion of the Gauls, and get taller than the Italians, is a fact known as long ago as the time of Julius Cæsar. But that, with the corn and the mutton, the beef and the beer of England, our rising population should be so inferior to that of Austria as to lead us at the first glance to receive with hesitation the admeasurements of Dr. Liharzik, is not a grateful reflection. We cannot but hope that the indication which we have ventured to give of a normal standard of height and weight, proper to each age, rough as it is, and susceptible of correction by careful and extended observations, may prove of material use. The importance of a standard, in such cases, is crucial. We have not space, at the present moment, to follow out that interesting part of the subject, the proportion between height and girth. From the army requirements, and from the list of measurements of recruits, it is but too certain that our average chest measurements fall fully 10 per cent. below the canon of Greek symmetry, for young men and women. The relation between proportionate chest girth and longevity has received the attention of physicians for more than a quarter of a century. Little has been heard of it of late. We earnestly hope that the skill and untiring industry of the medical and surgical professions will be directed to the important aim of gauging the proportions of those who will be the men of the next generation and the fathers of those who are to follow. What avails to us the "progress" of the nineteenth century, if it be accompanied by the physical degeneration of the race, and the Loss of the Stamina of Old England?

Price of Land near Liverpool.—Last week a jury called to assess the amount to be paid by the Cheshire Lines Committee to Mr. T. A. P. Littledale, for a portion of the Highfield Estate, Knotty Ash, containing thirteen acres, which was required for the purpose of a branch line from Garston to the north end of Liverpool, gave a verdict for 10,880*l.* The average valuation on behalf of the claimant was 16,383*l.*

COMPETITIONS.

Gloucester Public Baths.—At a meeting of the Gloucester town council, on the 30th ult., the town clerk read the following report of the baths committee:—"The committee appointed on the subject of public baths have to report that since the last meeting of the council they have opened the eleven plans for baths sent in for competition, and have very carefully considered them. They recommend that the first premium be awarded to the plan marked '1875,' and the second premium to the one under motto 'Pro Bono Publico.' '1875' is a well-arranged plan for ready access to every part, and the means of ingress are good. This appears the best plan for the location, which your committee strongly advise as the one to be selected, viz., the Public Park, immediately behind the Spa Pump-room. 'Pro Bono Publico' is a very clever plan, and although some of the details are not such as the committee would approve, they think the care and ability manifested fairly entitle its author to the second premium. It is proposed that the plans should be publicly exhibited for a few days, as may be arranged with your surveyor. The next step which the committee seek authority to take is to ascertain upon what terms one of the successful competitors would be willing to prepare a specification, with quantities, so that tenders may be obtained for carrying out the work. The rough estimates of '1875' and of 'Pro Bono Publico' are 5,000*l.* and 4,525*l.* respectively. But it is believed that a modified design may be carried out in a manner creditable to the city for about 4,000*l.*"

St. John's Church, Blackpool.—Thirteen sets of designs were submitted in competition for the erection of this church; and the committee having called in the services of Mr. Paley, of Lancaster, to advise them, selected those under the motto of "Circe," by Messrs. Ladds & Powell, of London, who have been commissioned to carry out the work. The church is to take the place of one comparatively old, and much smaller, which now stands on the site, and is to be pulled down. The new church is to accommodate 1,300 people, a considerable proportion of whom have to be provided for in galleries, owing to the somewhat restricted nature of the site. The design placed next in order of merit was marked "Red Cross on White Shield," by Mr. A. Bell, of Manchester.

Bassingbourne and Kneesworth Board Schools. Thirteen sets of designs were sent in for these schools, and the Board selected those by Messrs. Ladds & Powell, of London. The schools will accommodate 350 children.

Walsall Hospital.—The competition was between Messrs. H. Naden, Mr. Corson, and Mr. Nicholls; but, ultimately, the design of Mr. Naden, was, on the motion of Mr. Stanley, seconded by Mr. Cozens, adopted.

NEW DRAINAGE AND WATER SCHEMES.

Sheerness-on-Sea.—At a meeting of the Sheerness Local Board of Health on the 24th ult., it was announced that the Local Government Board had sanctioned the borrowing of 15,000*l.* for the purpose of improving the drainage and water-supply of the town. It was decided to put the contract out in three sections, to be arranged by the surveyor.

Maidstone.—One-third of the town of Maidstone, and that the newest part of it, is wholly destitute of public sewers. Consequently, all drainage is into cesspools, and in these parts of the town typhoid fever is prevalent. A complete system of drainage for the whole town, designed by Mr. Lewis Angell, C.E., is about to be submitted to the Local Government Board for approval. The *Maidstone Journal* refers to the article on the sanitary condition of the town which appeared in the *Builder* at the beginning of the year, and "which fully laid bare the many unhealthy localities of the town, but nothing whatever has been attempted towards lessening the shocking evils then clearly pointed out."

Weymouth.—Sir John Coode has submitted plans and specifications for the subsoil drainage of the park. The plans provide for stoneware pipes and tanks for the subsoil water, which is to be let off at certain times. No estimate accompanied the plans.

Leicester.—The Corporation of Leicester have given notice of their intention to promote a Bill in the ensuing Session to obtain powers to purchase the waterworks. Leicester is somewhat favoured, for, while the town is supplied by a

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